サンプリング回路の解析

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Analysis of Sampling Circuit

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This paper presents analysis of sampling circuit for high-frequency and high-precision waveform acquisition. We analyze effects of non-linearity of on-resistance in track-mode and finite aperture time. In the non-linearity analysis, we have derived formula for harmonic distortion due to non-linear on-resistance in track mode. In the finite aperture time analysis, we have derived formula for the bandwidth limitation due to its low-pass filter effects. We have checked that our theoretical calculation and SPICE simulation results agree well. We also have focused on the trade-off among bandwidth, aperture time, and time constant, we have derived their relationships based on the uncertainty principle between time and frequency; we believe that such analyses would be new in circuit design area.

キーワード: サンプリング回路, 高調波歪, アパーチャ時間, 不確定性原理

(Keyword: Sampling Circuit, Harmonic Distortion, Aperture Time, Uncertainty Principle)

1. はじめに

携帯電子機器の小型軽量化が進む現在、アナログ・ディ ジタル混載 LSI の需要は高く、A/D 変換器が重要な役目を 果たしている。A/D 変換には変換時間が必要であり、一時 的にアナログ情報を保持するサンプリング回路の存在が 必要不可欠である。サンプリング回路での誤差は最終的な ディジタル値にまで影響を与えるため、高性能化が求めら れている[1][2][3][4]。

また、CMOS プロセスの微細化に伴い信号の高周波化が 進んでいる。そのため、サンプリング時の非理想特性の影 響が顕著になり、A/D 変換の性能面に多くの問題を生じさ せている。しかし、その影響を明確に記述する理論はまだ 確立されていない。[5][6][7]

そこで本論文では、非理想特性の非線形性、アパーチャ 時間、時間と周波数の不確定性原理に着目し、それらの影 響の明確化を行う。

2. トラックモードでの非線形性

〈2.1〉問題設定

半導体素子には非線形特性が存在し、入力信号が非線形 素子を経由すると高調波を含んだ信号が出力される(図1)。 高調波は波形歪の発生要因であり、非線形性と高調波の関 係性を理解することが重要である。そこで図2(a)の CMOS を可変抵抗(抵抗値が入力電圧に依存)として考え、図2(b) のサンプリング回路のトラックモードにおける非線形性



図 1 半導体素子の非線形特性

Fig.1. Non-linear property of devices in LSI.



Fig.2. Sampling circuit.

解析を行う。そして MOS オン抵抗と高調波歪の影響の明 示式を導出する。

〈2.2〉ON 抵抗と高調波歪の影響の明示式の導出

MOS スイッチのオン抵抗 (*R_{on}*)を図 3 のようにゲート -ソース間電圧 (*V_g*)に依存する可変抵抗として考える。 入力電圧を図 4 のような場合、図 2 (b),図 3,図 4 から次 式を得ることができる。

$$I(t)dt = CdV_{out}(t)$$
(2)

$$R_{on} = -\frac{R_2 - R_1}{V_{g2} - V_{g1}} V_{in} + R_2 \dots (3)$$

$$V_{in}(t) = A\sin(\omega t) + V_{DC} \cdots (4)$$

式(1)~(4)より式(5)を得る。

式(5)のVoutをフーリエ級数展開する。

$$k=3$$
 までを考慮し、 $lpha_k, eta_k$ について計算する。算出結果
は付録に示す。算出結果から高調波が導出できる。

〈2.3〉ON 抵抗と高調波歪の影響の明示式の検証

図 2(b)の回路を用いた SPICE シミュレーションにより導 出式の妥当性を検証する。検証には Transient 解析を使用 し、SPICE シミュレーション解析と式(7)から得られる高 調波の比較を行う。SPICE 解析をするにあたり、可変抵抗 は MOS スイッチと近似した電圧変化をするようにモデル 化・設定した(図 5)。基にしたスイッチは TSMC 0.18µm CMOS の W=200µm NMOS を用いた。その他の回路パラ メータは表 1 に示す。検証結果を図 6 に示すが、これより 数値計算結果と解析結果が一致していることがわかる。

〈2.4〉まとめ

サンプリング回路のトラックモードでの NMOS オン抵 抗の入力電圧依存性と高調波の関係を定量的に導出し、解 析結果と SPICE シミュレーション結果を比較することで 導出式の妥当性を示せた。

3. 有限アパーチャ時間の影響

(3.1) 問題設定

図 2(a) のサンプリング回路において、トラックモード では抵抗Rとホールド容量Cによって時定数τ₁ = RCの帯域 制限が生じる。また、スイッチのターンオフ時間(アパー チャ時間)がゼロではなく有限の値τの場合は,サンプリ ングの際に出力電圧は入力電圧が平均化(すなわちローパ スフィルタされたものとなり、帯域制限が生じる。この 2 つの帯域制限の影響について明示的に導出する。



図 3 $V_g \geq R_{on}$ の関係 Fig.3.Relationship between V_a and R_{on} .



図 4 入力電圧

Fig.4. Input voltage.



図 5 SPICE での $V_g \ge R_{on}$ の関係

Fig.5. Relationship between V_g and R_{on} for SPICE simulation.

表 1 非線形性解析回路パラメータ

Table1. Circuit parameters of non-linearity analysis.

R	$50 \ \Omega$
С	1 pF
V _{DC}	$0.5~\mathrm{V}$
V _{in}	$0.5~\mathrm{V}$
f _{in}	$100 \mathrm{~MHz}$



〈3.2〉有限アパーチャ時間の影響の明示式

サンプリング回路で上記2つの帯域制限の要因を考慮した伝達関数を導出すると次のようになる。[8][9]

$$\frac{V_{out}}{V_{in}} = \frac{sinc(\omega\tau_2)}{sinc(\omega\tau_2) + j\omega\tau_1}$$
(8)
$$(\tau_1 = RC , \ \tau_2 = \tau)$$

〈3.3〉実効アパーチャ時間

図 5(a)より、R_{on}の特性が約 0.4~0.8V の範囲で大きく 変化していることがわかる。そこで特性が大きく変化して いる電圧変化時間を実効アパーチャ時間として考える(図 7)。図 5(a)の縦軸を逆数表示にしたグラフを図 8 に示す。 サブスレッショルド領域の接点と閾値電圧V_{th}との交点を 点 A、式(9)とグラフとの交点を点 B とし、点 A-B 間の電 圧差 0.37V を実効アパーチャ時間に対応する電圧差とす る (図 9)。

実効アパーチャ時間の割合は 0.37/1.8 となる。 (3.3) アパーチャ時間の影響の明示式の検証

式(8)と実効アパーチャ時間を考慮した図 2(a)の回路の SPICE 解析結果を-3dB帯域で比較する。SPICE 解析に用 いた回路パラメータを表 2 に、比較結果を図 10 に示す。T はサンプリング周期である。図 10 より理論値と解析結果 が一致しており、式(8)及び実効アパーチャ時間の有効性を

表 2 アパーチャ時間解析回路パラメータ

Table1. Circuit parameters of aperture time

	analysis.
R	$50 \ \Omega$
С	1 pF
Т	0.1 µs
V _{in}	$0.15~\mathrm{V}$
V_{DC}	$0.15~\mathrm{V}$
V_g	0~1.8 V

確認できた。

(3.4) まとめ

MOSサンプリング回路ではNMOSスイッチのオン抵抗 が大きく変化するゲート電圧近傍の変化時間が実効的な アパーチャ時間として作用することが解明できた。そして その計算式を導出し、有限アパーチャ時間の影響が SPICE シミュレーション結果と一致することを確認した。



 $\begin{array}{c} \widehat{\textcircled{u}} & 10^{-1} \\ \widehat{\overbrace{u}} & 10^{-3} \\ \widehat{\overbrace{u}} & 10^{-5} \\ \widehat{\overbrace{u}} & 10^{-7} \\ \widehat{\overbrace{u}} & 10^{-7} \\ 10^{-9} \\ 0 & 0.5 & 1.0 & 1.5 & 2.0 \\ & & & & \\ Vg[V] \end{array}$



Fig.8. Relationship between V_g and $1/R_{on}$.



図 9 グラフ上での点 A, B

Fig.9. Points A, B on the graph.



Fig.10. Aperture time formula verification result with SPICE simulation

4. サンプリング回路の不確定性関係



図 11 時間と周波数の不確定性関係

Fig11. Uncertainty relationships between time and frequency

時間と周波数の不確定性関係は、時間波形と周波数スペクトルのいずれをも同時に任意に小さくできないという 数学的事実を述べている(図 11)[10][11]。

$$\sigma_{\tau}\sigma_{\omega} \ge \frac{1}{2}$$
(10)

〈4.1〉問題設定

RC 回路の時定数 τ_1 と遮断周波数 ω_h には次の関係がある。

遮断周波数とは回路の利得が√1/2になる周波数である。 利得は伝達関数から導出することができるため、式(8)の伝 達関数を用いることで、有限アパーチャ時間を考慮したサ ンプリング回路の不確定性関係を導出する。

 <4.2〉アパーチャ時間を考慮した不確定性関係の導出 式(8)が√1/2の場合について考える。

$$\left|\frac{V_C}{V_{in}}\right| = \left|\frac{\operatorname{sinc}(\omega\tau_2)}{\operatorname{sinc}(\omega\tau_2)} + j\omega\tau_1\right|$$
$$= \sqrt{\frac{\operatorname{sinc}^2(\omega\tau_2)}{\operatorname{sinc}^2(\omega\tau_2) + (\omega\tau_1)^2}} = \sqrt{\frac{1}{2}}$$

 $\operatorname{sinc}(\omega \tau_2) = \omega \tau_1 \cdots (12)$

ここで、sinc 関数を2次の項までテイラー展開する。

式(13)において大小関係を比較する(図 12)と、次式の結果



図 12 sinc 関数テイラー展開近似の比較 Fig.12. Sinc function and its Taylor

を得る。

式(12), (14)より、

ここで、通過帯域・時定数を書き直すと次式を得る。

$$\begin{cases} \omega \ \rightarrow \ \sigma_{\omega} \\ \tau_1 \ \rightarrow \ \sigma_{\tau_1} \end{cases}$$

- ローパスフィルタを設計する場合
 - $\left\{ egin{array}{cc} \sigma_{\omega}: 帯域 \ \sigma_{\tau}: 時定数 \end{array}
 ight.$

式(10)の不等式は帯域を狭めるには時定数を大きくし なければならないということを示している。つまり時定 数を RC と考えると、帯域が狭いローパスフィルタはチ ップ面積を大きくしなければならないということを示 している。

高周波信号のサンプリングの場合

$$\left\{ egin{smallmatrix} \sigma_{\omega}: 帯域 \ \sigma_{\tau}: アパーチャ時間 \end{matrix}
ight.$$

式(10)の不等式はアパーチャ時間を小さくしなければ 帯域を広くできないということは示していない。この場 合、(10)式で等号が成り立つのは周波数分布、時間波形 が正規分布の場合であり、この場合を考える。

$$\sigma_{\tau}\sigma_{\omega} = \frac{1}{2}$$
 (17)

アパーチャ時間を小さくしなければ帯域を広くできな いということを示している。

アパーチャ時間、オン抵抗の両方を考慮した高周波信号
 サンプリングの場合

2つの時定数を考える次式が導出できる。

$$\sigma_{\omega}\sigma_{\tau_1} + \frac{1}{6}(\sigma_{\omega}\tau_2)^2 = 1$$
 (18)

 $(\sigma_{\omega}: 帯域, \sigma_{\tau_1}: 時定数, \tau_2: アパーチャ時間)$ オン抵抗がある場合は、同じ帯域を得るにはアパーチャ 時間を小さくしなければならないということがわかる。 $\langle 4.4 \rangle$ 結果

RC 時定数、アパーチャ時間、帯域のトレードオフを明確 に示すことができた。つまり、サンプリング回路における 不確定性関係を示すことができた。

expansion approximation.

$\langle 4.5 \rangle$	離散フーリ	ノエ変換での時間	•	周波数の関係
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離散フーリエ変換(Discrete Fourier Transform: DFT)に は以下の関係がある。

$T_S = 1/f_S \dots \dots$
<i>∫fs</i> ∶ サンプリング周波数
(_{Ts} :サンプリング時間(= Δt)

N 点で DFT をすると周波数分解能Δ*f*は

 $\Delta f = 1/(T_S \cdot N)$ (20) となり、

量子力学の位置と運動量の不確定性関係は信号処理に おける時間と周波数に対応させて考えることができる[10]。 そのため、一般的に不確定性原理は「ハイゼンベルクの不 確定性原理」と「信号処理の不確定原理」のことをいう。

ここで、不確定性の基本原則を以下の 3 点に求めると

- ① 量子力学のハイゼンベルクの不確定性原理と類推関係
- ② シュワルツの不等式から導き出せる。
- ③ 分布の広がりを問題にしている。

拡がり具合をΔ偏差で表すことができる。

<4.3>で議論した不確定性関係は不確定性原理の一つの 拡張形であると判断できる。これに対し、信号処理の不確 定性原理は現象(波形)をフーリエ変換で見た時の性質で あり、DFTの時間・周波数関係はフーリエ変換の性質とし て捉えることができる。

つまり、時間・周波数関係において<4.3>は厳密な意味 で不確定性原理の表現、広く解釈するとどちらも時間と周 波数の不確定性関係として捉えることができる。

〈4.6〉今後の検討課題

時間と周波数の不確定性関係にプランク定数hを取り入 れることで不確定性関係に次元を与え、物理領域との繋が りを示す。

例として光と運動エネルギーの関係性について示す。時 間と周波数の不確定性関係は

であり、両辺にh/2πを乗算すると次式が得られる。

$$\frac{h}{2\pi}\Delta\omega\cdot\Delta\tau \ge \frac{h}{4\pi}$$
(23)

ここで、光のエネルギーは次式(24)で表せるため、

 $E = \frac{h}{2\pi} \cdot \omega$ (24)

式(25)が得られ、フーリエ級数の不確定性関係から量子力 学の不確定性原理が導出できる。この考えは光を電子に置 き換えても成立するため、電子回路も不確定性原理の制約 を受けるはずである。 現在、ハイゼンベルクの不確定性原理に補正項を加えた 小澤の不等式が発表されている[12]。これは測定誤差Δと 量子ゆらぎσの関係を定式化している。

式(26)を時間とエネルギーの関係で考える。 $\Delta E \Delta t + \sigma E \Delta t + \sigma t \Delta E \ge \frac{h}{4\pi}$ (27)

ここで、 $\Delta t = 0$ の測定ができたとしても式(27)は $\sigma t \Delta E \ge \frac{h}{4\pi}$ (28)

となり、 $E = \infty$ になることはない。そのため時間ゆらぎ σt からエネルギーの測定誤差を求めることができる。

続いて以下の測定ができた場合について考える。

 $\Delta t = \frac{\sigma t}{2}$, $\Delta E = \frac{\sigma E}{2}$(29)

式(29)を式(27)に代入すると

となり、小澤の不等式では量子ゆらぎ1/2の精度で時間と エネルギーの測定が実現できるということを表している。 つまり、ハイゼンベルクの不確定性原理より粒子の高精度 な精密測定が可能になる。そこで、回路に不確定性原理の 考えを取り入れ、回路測定という見地から小澤の不等式の 検証をしていきたいと考えている。

5. まとめ

信号の高周波化が進むにつれてサンプリング回路の非 理想特性の影響の問題は顕著となるが、それらの影響を記 述する理論は確立されていない。そこで非理想特性の非線 形性・アパーチャ時間に着目し、それらの明示式を導出し た。そしてその妥当性について SPICE シミュレーション を用いて検証・評価を行った。

非線形性解析では MOS スイッチのオン抵抗の入力電圧 依存性と高調波の影響を定量的に示し、計算結果と SPICE 解析結果が一致することを確認した。

有限アパーチャ時間の影響解析では、有限アパーチャ時 間の影響を考慮した式を導出した。そして実効的なアパー チャ時間として作用する実効アパーチャ時間を考慮する ことで、計算結果と SPICE 解析結果が一致することを確 認した。

アパーチャ時間・時定数・帯域を考慮したサンプリング 回路における不確定性関係を示した。そして高周波信号サ ンプリングで帯域を維持するには、非理想特性であるアパ ーチャ時間を小さくしなければならないということを解 析的に示した。

サンプリング回路のおける非理想特性の影響をいくつ かの視点から明示的に導出し、確認することができた。

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付録:式(6)におけるα_k, β_kの算出結果

• α₁

 $\left(\lambda \left(v_{g1} - v_{g2} \right)^{2} \left(3 c^{4} \omega^{4} R_{1}^{4} \left(2 \lambda^{4} - 9 \lambda^{2} v_{Dc}^{2} + 24 v_{Dc}^{4} \right) + 2 \left(v_{g1} - v_{g2} \right)^{4} + c^{2} \omega^{2} R_{2}^{2} \left(v_{g1} - v_{g2} \right)^{2} \left(7 \lambda^{2} + 26 v_{Dc}^{2} + 26 v_{g1}^{2} + 52 v_{Dc} \left(v_{g1} - v_{g2} \right) - 5 c^{4} \omega^{4} R_{1}^{3} R_{2} \left(4 \lambda^{4} - 18 \lambda^{2} v_{Dc}^{2} + 48 v_{Dc}^{4} + 48 v_{Dc}^{3} \left(v_{g1} - v_{g2} \right) + 9 \lambda^{2} v_{Dc} \left(-v_{g1} + v_{g2} \right) \right) + 3 c^{4} \omega^{4} R_{2}^{4} \left(2 \lambda^{4} + 24 v_{Dc}^{4} + 24 v_{g1}^{4} + 96 v_{Dc}^{3} \left(v_{g1} - v_{g2} \right) - 96 v_{g1}^{3} v_{g2} - 9 \lambda^{2} v_{g2}^{2} + 24 v_{g2}^{4} - 9 v_{g1}^{2} \left(\lambda^{2} - 16 v_{g2}^{2} \right) - 9 v_{Dc}^{3} \left(\lambda^{2} - 16 v_{g1}^{2} + 32 v_{g1} v_{g2} - 16 v_{g2}^{2} \right) + 6 v_{Dc} \left(v_{g1} - v_{g2} \right) \left(-3 \lambda^{2} + 16 v_{g1}^{2} - 32 v_{g1} v_{g2} + 16 v_{g2}^{2} \right) + 6 v_{g1} \left(3 \lambda^{2} v_{g2} - 16 v_{g2}^{3} \right) + c^{2} \omega^{2} R_{1}^{2} \left(\left(7 \lambda^{2} + 26 v_{Dc}^{2} \right) \left(v_{g1} - v_{g2} \right) \left(2 v_{g1} - v_{g2} \right) + 96 v_{Dc}^{3} \left(v_{g1} - v_{g2} \right) - 6 v_{Dc}^{2} \left(3 \lambda^{2} - 8 v_{g1}^{2} + 16 v_{g1} v_{g2} - 8 v_{g2}^{2} \right) + \lambda^{2} \left(4 \lambda^{2} - 3 v_{g1}^{2} + 6 v_{g1} v_{g2} - 3 v_{g2}^{2} \right) \right) \right) - 2 c^{2} \omega^{2} R_{1}^{2} \left(\left(7 \lambda^{2} + 26 v_{Dc}^{2} \left(v_{g1} - v_{g2} \right) \left(v_{g1} - v_{g2} \right)^{2} + 3 c^{2} \omega^{2} R_{2}^{2} \right) \right) \right)$

 $\left(48 \ v_{DC}^4 + 144 \ v_{DC}^3 (\ v_{g1} - v_{g2}) + \lambda^2 \left(4 \ \lambda^2 - 9 \ v_{g1}^2 + 18 \ v_{g1} \ v_{g2} - 9 \ v_{g2}^2 \right) - 18 \ v_{DC}^2 \left(\lambda^2 - 8 \ v_{g1}^2 + 16 \ v_{g1} \ v_{g2} - 8 \ v_{g2}^2 \right) + 3 \ v_{DC} \left(v_{g1} - v_{g2} \right) \left(-9 \ \lambda^2 + 16 \ v_{g1}^2 - 32 \ v_{g1} \ v_{g2} + 16 \ v_{g2}^2 \right) \right) \right) \right) / \left(2 \left(9 \ c^6 \ \omega^6 \ R_1^6 \ v_{DC}^2 \left(\lambda^2 - 2 \ v_{DC}^2 \right)^2 - 18 \ c^6 \ \omega^6 \ R_1^5 \ R_2 \ v_{DC} \left(\lambda^2 - 2 \ v_{DC}^2 \right) \right) \right) + \left(v_{g1} - v_{g2} \right) \left(-9 \ \lambda^2 + 16 \ v_{g1}^2 - 32 \ v_{g1} \ v_{g2} + 16 \ v_{g2}^2 \right) \right) \right) \right) \right) + \left(2 \left(9 \ c^6 \ \omega^6 \ R_1^6 \ v_{DC} \left(\lambda^2 - 2 \ v_{DC}^2 \right)^2 - 18 \ c^6 \ \omega^6 \ R_1^5 \ R_2 \ v_{DC} \left(\lambda^2 - 2 \ v_{DC}^2 \right) \right) \right) \right) + \left(v_{g1} - v_{g2} \right) + \left(v_{g1} - v_{g2} \right)^6 + 2 \left(v_{g1} - v_{g2} \right$

- $9 C^{6} \omega^{6} R_{2}^{6} (V_{DC} + V_{g1} V_{g2})^{2} \left(\lambda^{2} 2 V_{DC}^{2} 2 V_{g1}^{2} 4 V_{DC} (V_{g1} V_{g2}) + 4 V_{g1} V_{g2} 2 V_{g2}^{2} \right)^{2} + 2 C^{2} \omega^{2} R_{2}^{2} (V_{g1} V_{g2})^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2} \right)^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2} \right)^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2} \right)^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2} \right)^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2} \right)^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2} \right)^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 7 V_{g1}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2} \right) \right)$
- $\begin{array}{c} C^{4} \ \omega^{4} \ R_{2}^{4} \ (V_{g1} V_{g2})^{2} \ \left(4 \ \lambda^{4} \ + 49 \ V_{D1}^{4} \ + 49 \ V_{g1}^{4} \ + 196 \ V_{D2}^{3} \ (V_{g1} V_{g2}) \ 196 \ V_{g1}^{3} \ V_{g2} \ 8 \ \lambda^{2} \ V_{g2}^{2} \ + 49 \ V_{g2}^{4} \ + 4 \ V_{DC} \ (V_{g1} V_{g2}) \ \left(-4 \ \lambda^{2} \ + 49 \ V_{g1}^{2} \ 98 \ V_{g1} \ V_{g2} \ + 49 \ V_{g2}^{2} \ + 9 \ V_{g2}^{2} \ + 4 \ V_{DC} \ (V_{g1} V_{g2}) \ \left(-4 \ \lambda^{2} \ + 49 \ V_{g1}^{2} \ 98 \ V_{g1} \ V_{g2} \ + 49 \ V_{g2}^{2} \ + 4 \ V_{DC} \ (V_{g1} V_{g2}) \ \left(-4 \ \lambda^{2} \ + 49 \ V_{g2}^{2} \ 98 \ V_{g1} \ V_{g2} \ + 49 \ V_{g2}^{2} \ + 4 \ V_{g1} \ \left(4 \ \lambda^{2} \ V_{g2} \ 49 \ V_{g2}^{2} \ \right) \ + C^{4} \ \omega^{4} \ R_{1}^{4} \ \left(\left(4 \ A^{4} \ 8 \ \lambda^{2} \ V_{DC}^{2} \ + 49 \ V_{DC}^{2} \ (V_{g1} V_{g2}) \ ^{2} \ + 9 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ + 6 \ V_{g1}^{2} \ 49 \ V_{g2}^{2} \ \right) \ + C^{4} \ \omega^{4} \ R_{1}^{4} \ \left(\left(4 \ A^{4} \ 8 \ \lambda^{2} \ V_{DC}^{2} \ + 49 \ V_{DC}^{2} \ (V_{g1} V_{g2}) \ ^{2} \ + 9 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ + 6 \ V_{g1}^{2} \ 49 \ V_{g2}^{2} \ \right) \ + C^{4} \ \omega^{4} \ R_{1}^{4} \ \left(\left(4 \ A^{4} \ 8 \ A^{2} \ V_{DC}^{2} \ + 49 \ V_{DC}^{2} \ (V_{g1} V_{g2}) \ ^{2} \ + 9 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ + 10 \ C^{2} \ R_{2}^{2} \ + 10 \ C^{2} \ R_{2}^{2} \ + 10 \ C^{2} \ R_{2}^{2} \ + 10 \ R_{2}^{2} \ R_{2}^{2} \ + 10 \ R_{2}^{2} \ R_{2}^{2} \ + 10 \ R_{2}^{2} \ R_{2}^{2} \ R_{2}^{2} \ + 10 \ R_{2}^{2} \ R_{2}^{2} \ + 10 \ R_{2}^{2} \ R_{2}^{2} \ R_{2}^{2} \ R_{2}^{2} \ + 10 \ R_{2}^{2} \ R_{2}^{$

 $\left(60 \, v_{Dc}^{6} + 10 \, x^{4} \, v_{Dc} \, (v_{g1} - v_{g2}) + 80 \, z^{2} \, v_{Dc}^{2} + 49 \, v_{Dc}^{3} \, (v_{g1} - v_{g2}) + 120 \, v_{Dc}^{5} \, (v_{g1} - v_{g2}) + x^{4} \, (v_{g1} - v_{g2})^{2} + 3 \, x^{2} \, v_{Dc}^{2} \, (5 \, x^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{g2}^{2}) - 60 \, v_{Dc}^{4} \, (x_{g1}^{2} - v_{g2}^{2} + 2 \, v_{g1} \, v_{g2} - v_{g2}^{2}))) - 4 \, z^{4} \, u^{4} \, w^{2} \, r^{2} \, x^{2} \, v_{Dc}^{2} \, (5 \, x^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{g2}^{2}) - 60 \, v_{Dc}^{4} \, (x_{g1}^{2} - v_{g2}^{2} + 2 \, v_{g1} \, v_{g2} - v_{g2}^{2}))) - 4 \, z^{4} \, u^{4} \, w^{2} \, r^{2} \, x^{2} \, v_{Dc}^{2} \, (5 \, x^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{g2}^{2}) - 60 \, v_{Dc}^{4} \, (x_{g1}^{2} - v_{g2}^{2} + 2 \, v_{g1} \, v_{g2} - v_{g2}^{2}))) - 4 \, z^{4} \, u^{4} \, w^{2} \, r^{2} \, x^{2} \, v_{Dc}^{2} \, (5 \, x^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{g2}^{2}) - 60 \, v_{Dc}^{4} \, (x_{g1}^{2} - v_{g2}^{2} + 2 \, v_{g1}^{2} \, v_{g2} - v_{g2}^{2}))) - 4 \, z^{4} \, u^{4} \, w^{2} \, r^{2} \, v_{Dc}^{2} \, (v_{g1} - v_{g2})^{2} \, v_{Dc}^{2} \,$

 $48 \, v_{g1} \, v_{g2} - 24 \, v_{g2}^2) + k^2 \, v_{DC} \, (v_{g1} - v_{g2}) \, \left(5 \, k^2 - 4 \, v_{g1}^2 + 8 \, v_{g1} \, v_{g2} - 4 \, v_{g2}^2 \right) \\ - 20 \, v_{DC}^4 \, \left(k^2 - 3 \, v_{g1}^2 + 6 \, v_{g1} \, v_{g2} - 3 \, v_{g2}^2 \right) \\ + 20 \, v_{DC}^2 \, \left(v_{g1} - v_{g2} \right) \, \left(2 \, k^2 + 7 \, v_{DC}^2 \, v_{g1} - v_{g2} \right) \right) \\ - 2 \, c^2 \, \omega^2 \, R_1 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^4 + 2 \, c^2 \, \omega^2 \, R_2^2 \, (v_{g1} - v_{g2})^2 \, \left(49 \, v_{DC}^4 + 147 \, v_{3C}^2 \, (v_{g1} - v_{g2}) + 4 \, k^2 \, \left(k^2 - v_{g1}^2 + 2 \, v_{g1} \, v_{g2} - 2 \, v_{g2}^2 \right) \\ + 2 \, c^2 \, \omega^2 \, R_1 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^4 + 2 \, c^2 \, \omega^2 \, R_2^2 \, (v_{g1} - v_{g2})^2 \, \left(49 \, v_{DC}^4 + 147 \, v_{3C}^2 \, (v_{g1} - v_{g2}) + 4 \, k^2 \, \left(k^2 - v_{g1}^2 + 2 \, v_{g1} \, v_{g2} - v_{g2}^2 \right) \\ + 2 \, c^2 \, \omega^2 \, R_1 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^2 \right) \right) \\ - 2 \, c^2 \, \omega^2 \, R_1 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^2 \right) \right) \\ - 2 \, c^2 \, \omega^2 \, R_1 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^2 \right) \right) \\ - 2 \, c^2 \, u^2 \, R_2 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^2 \right) \right) \\ - 2 \, c^2 \, u^2 \, R_2 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^2 \right) \right) \\ - 2 \, c^2 \, u^2 \, R_2 \, \left(2 \, \left(2 \, k^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} - v_{g2})^2 \right) \right) \\ - 2 \, c^2 \, R_2 \, R$

- $\left(12 \ v_{5c}^{5} + 48 \ v_{4c}^{4} (v_{g1} v_{g2}) 12 \ v_{5c}^{2} \left(\lambda^{2} 6 \ v_{g1}^{2} + 12 \ v_{g1}^{2} v_{g2}^{2} 6 \ v_{g2}^{2}\right) + 2 \ \lambda^{2} \left(v_{g1} v_{g2}\right) \left(\lambda^{2} 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} 2 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 12 \ v_{g1}^{2}\right) + 2 \ v_{5c}^{2} \left(\lambda^{2} + 12 \ v_{g1}^{2} + 2 \ v_{g1}^{2}\right) \left(-20 \ \lambda^{2} + 12 \ v_{g2}^{2}\right) + 2 \ v_{g1}^{2} \left(5 \ \lambda^{2} \ v_{g2} 6 \ v_{g2}^{2}\right)\right) \right) + 2^{2} \ \omega^{2} \ R_{1}^{2} \left(2 \ \lambda^{2} + 7 \ v_{5c}^{2}\right) \left(v_{g1} v_{g2}\right)^{4} + 2 \ v_{5c}^{2} \left(\lambda^{2} + 2 \ v_{5c}^{2}\right) \left(\lambda^{2$
- $2 C^{2} \omega^{2} R_{2}^{2} (V_{q1} V_{q2})^{2} (147 V_{bc}^{4} 24 R^{2} V_{bc} (V_{q1} V_{q2}) + 294 V_{bc}^{3} (V_{q1} V_{q2}) 3 V_{bc}^{2} (8 R^{2} 49 V_{q1}^{2} + 98 V_{q1} V_{q2} 49 V_{q2}^{2}) + 4 R^{2} (3 R^{2} V_{q1}^{2} + 2 V_{q1} V_{q2} V_{q2}^{2}) + 9 C^{4} \omega^{4} R_{2}^{4} (60 V_{bc}^{5} + 240 V_{bc}^{5} (V_{q1} V_{q2}) + 4 R^{2} V_{bc} (V_{q1} V_{q2}) (5 R^{2} 12 V_{q1}^{2} + 24 V_{q1} V_{q2} 12 V_{q2}^{2}) 60 V_{bc}^{4} (R^{2} 6 V_{q1}^{2} + 12 V_{q1} V_{q2} 6 V_{q2}^{2}) + 2 R^{2} (V_{q1} V_{q2})^{2} (3 R^{2} 2 V_{q1}^{2} + 4 V_{q1} V_{q2} 12 V_{q2}^{2}) 60 V_{bc}^{4} (R^{2} 6 V_{q1}^{2} + 12 V_{q1} V_{q2} 6 V_{q2}^{2}) + 2 R^{2} (V_{q1} V_{q2})^{2} (3 R^{2} 2 V_{q1}^{2} + 4 V_{q1} V_{q2} 2 V_{q2}^{2}) + 80 V_{30}^{3} V_{q2} 80 V_{30}^{3} V_{q2} 48 R^{2} V_{q2}^{2} + 20 V_{q2}^{4} 24 V_{q1}^{2} (2 R^{2} 5 V_{q2}^{2}) + 16 V_{q1} (6 R^{2} V_{q2} 5 V_{q2}^{2})))))$

• α₂

- - $\left(60 \, v_{DC}^{6} + 10 \, A^{4} \, v_{DC} \left(v_{g1} v_{g2} \right) 80 \, A^{2} \, v_{DC}^{5} \left(v_{g1} v_{g2} \right) + 120 \, v_{DC}^{5} \left(v_{g1} v_{g2} \right) + A^{4} \left(v_{g1} v_{g2} \right)^{2} + 3 \, A^{2} \, v_{DC}^{2} \left(5 \, A^{2} 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} 8 \, v_{g2}^{2} \right) 50 \, v_{DC}^{4} \left(A^{2} v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} v_{g2}^{2} \right) \right) \right) 4 \, c^{4} \, \omega^{4} \, R_{1}^{2} \, R_{2} \left(\left(v_{g1} v_{g2} \right)^{2} \left(4 \, A^{4} 8 \, A^{2} \, v_{DC}^{2} + 49 \, v_{DC}^{4} + 49 \, v_{DC}^{3} \left(v_{g1} v_{g2} \right) + 4 \, A^{2} \, v_{DC} \left(-v_{g1} + v_{g2} \right) \right) \right) + 9 \, c^{2} \, \omega^{2} \, R_{2}^{2} \left(20 \, v_{DC}^{5} + 60 \, v_{DC}^{5} \left(v_{g1} v_{g2} \right) + A^{4} \, v_{DC} \left(c_{g1} v_{g2} \right) + A^{2} \, v_{DC}^{2} \left(c_{g1} c_{g1} + c_{$
 - $2 C^{2} \omega^{2} R_{1} R_{2} \left(2 \left(2 A^{2} + 7 V_{DC}^{2} + 7 V_{DC} \left(V_{g1} V_{g2}\right)\right) \left(V_{g1} V_{g2}\right)^{4} + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2}\right)^{2} \left(49 V_{DC}^{4} + 147 V_{DC}^{3} \left(V_{g1} V_{g2}\right) + 4 A^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} \left(V_{g1} V_{g2}\right) \left(-12 A^{2} + 49 V_{g1}^{2} 98 V_{g1} V_{g2} + 49 V_{g2}^{2}\right) + v_{DC}^{2} \left(-8 A^{2} + 147 V_{g1}^{2} 294 V_{g1} V_{g2} + 147 V_{g2}^{2}\right) + 9 C^{4} \omega^{4} R_{2}^{4} \left(V_{DC} + V_{g1} V_{g2}\right)$
 - $\left(12 \ v_{DC}^{5} + 48 \ v_{DC}^{4} \left(V_{g1} V_{g2}\right) 12 \ v_{D}^{3} \left(\lambda^{2} 6 \ v_{g1}^{2} + 12 \ v_{g1} \ v_{g2} 6 \ v_{g2}^{2}\right) + 2 \ \lambda^{2} \left(v_{g1} v_{g2}\right) \left(\lambda^{2} 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} 2 \ v_{g2}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} 24 \ v_{g1} \ v_{g2} + 12 \ v_{g2}^{2}\right) + 2 \ v_{DC}^{2} \left(3 \ \lambda^{4} + 12 \ v_{g1}^{4} 48 \ v_{g1}^{3} \ v_{g2} 20 \ \lambda^{2} \ v_{g2}^{2}\right) + 4 \ v_{g1} \left(5 \ \lambda^{2} \ v_{g2} 6 \ v_{g2}^{2}\right)\right) \right) + c^{2} \ \omega^{2} \ R_{1}^{2} \left(2 \ \left(2 \ \lambda^{2} + 7 \ v_{DC}^{2}\right) \ \left(v_{g1} v_{g2}\right)^{4} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}\right) + 2 \ v_{g2}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g2}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g2}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^$

 - $R_{2}^{4} \left(60 \, v_{DC}^{6} + 240 \, v_{DC}^{5} (v_{g1} v_{g2}) + 4 \, \lambda^{2} \, v_{DC} (v_{g1} v_{g2}) (5 \, \lambda^{2} 12 \, v_{g1}^{2} + 24 \, v_{g1} \, v_{g2} 12 \, v_{g2}^{2}) 60 \, v_{DC}^{4} \left(\lambda^{2} 6 \, v_{g1}^{2} + 12 \, v_{g1} \, v_{g2} 6 \, v_{g2}^{2} \right) + 2 \, \lambda^{2} (v_{g1} v_{g2})^{2} \left(3 \, \lambda^{2} 2 \, v_{g1}^{2} + 4 \, v_{g1} \, v_{g2} 22 \, v_{g2}^{2} \right) + 80 \, v_{DC}^{3} \left(v_{g1} v_{g2} \right) \left(-2 \, \lambda^{2} + 3 \, v_{g1}^{2} 6 \, v_{g1} \, v_{g2} + 3 \, v_{g2}^{2} \right) + 3 \, v_{DC}^{2} \left(5 \, \lambda^{4} + 20 \, v_{g1}^{4} 80 \, v_{g1}^{3} \, v_{g2} 48 \, \lambda^{2} \, v_{g2}^{2} + 20 \, v_{g1}^{4} 24 \, v_{g1}^{2} \left(2 \, \lambda^{2} 5 \, v_{g2}^{2} \right) + 16 \, v_{g1} \left(6 \, \lambda^{2} \, v_{g2} 5 \, v_{g2}^{3} \right) \right) \right) \right) \right)$

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• α₃

 $\left(\lambda^{3} \ C^{2} \ \omega^{2} \ (R_{1} - R_{2})^{2} \ (V_{g1} - V_{g2})^{2} \ (C^{2} \ \omega^{2} \ R_{1}^{2} \ (2 \ \lambda^{2} - 11 \ V_{DC}^{2}) + 2 \ C^{2} \ \omega^{2} \ R_{1} \ R_{2} \ (-2 \ \lambda^{2} + 11 \ V_{DC}^{2} + 11 \ V_{DC} \ (V_{g1} - V_{g2})^{2} + (V_{g1} - V_{g2})^{2} + (V_{g1} - V_{g2})^{2} + (V_{g1} - V_{g2})^{2} \right)$

- $\left. c^2 \, \omega^2 \, R_2^2 \, \left(2 \, \mathtt{A}^2 11 \, \mathtt{V}_{\text{DC}}^2 11 \, \mathtt{V}_{\text{g1}}^2 22 \, \mathtt{V}_{\text{DC}} \, \left(\mathtt{V}_{\text{g1}} \mathtt{V}_{\text{g2}} \right) + 22 \, \mathtt{V}_{\text{g1}} \, \mathtt{V}_{\text{g2}} 11 \, \mathtt{V}_{\text{g2}}^2 \right) \right) \right) \Big/ \\$
- $\left(2 \left(9 \text{ C}^{6} \omega^{6} \text{ R}_{1}^{6} \text{ V}_{\text{DC}}^{2} \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right)^{2} 18 \text{ C}^{6} \omega^{6} \text{ R}_{1}^{5} \text{ R}_{2} \text{ V}_{\text{DC}} \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right) \left(3 \text{ A}^{2} \text{ V}_{\text{DC}} 6 \text{ V}_{\text{DC}}^{3} + \lambda^{2} \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}}\right) 6 \text{ V}_{\text{DC}}^{2} \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}}\right)\right) + \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}}\right)^{6} + 2 \text{ V}_{\text{DC}}^{2} \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right) \left(3 \text{ A}^{2} \text{ V}_{\text{DC}} 6 \text{ V}_{\text{DC}}^{3} + \lambda^{2} \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}}\right) 6 \text{ V}_{\text{DC}}^{2} \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}}\right)\right) + \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}}\right)^{6} + 2 \text{ V}_{\text{DC}}^{2} \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right) \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right)^{6} + 2 \text{ V}_{\text{DC}}^{2} \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right) \left(\lambda^{2} 2 \text{ V}_{\text{DC}}^{2}\right)^{6} + 2 \text{ V}_{\text{DC}}^{2} \left(\lambda^{2} 2 \text{ V}_$

 $9 c^{6} \omega^{6} R_{2}^{6} (v_{DC} + v_{g1} - v_{g2})^{2} \left(\lambda^{2} - 2 v_{DC}^{2} - 2 v_{g1}^{2} - 4 v_{DC} (v_{g1} - v_{g2}) + 4 v_{g1} v_{g2} - 2 v_{g2}^{2}\right)^{2} + 2 c^{2} \omega^{2} R_{2}^{2} (v_{g1} - v_{g2})^{4} \left(2 \lambda^{2} + 7 v_{DC}^{2} + 7 v_{g1}^{2} + 14 v_{DC} (v_{g1} - v_{g2}) - 14 v_{g1} v_{g2} + 7 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(4 \lambda^{4} + 49 v_{DC}^{4} + 49 v_{g1}^{4} + 196 v_{DC}^{3} (v_{g1} - v_{g2}) - 196 v_{g1}^{3} v_{g2} - 8 \lambda^{2} v_{g2}^{2} + 49 v_{g2}^{4} + 4 v_{DC} (v_{g1} - v_{g2}) \left(-4 \lambda^{2} + 49 v_{g1}^{2} - 98 v_{g1} v_{g2} + 49 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(4 \lambda^{4} + 49 v_{DC}^{4} + 49 v_{g1}^{4} + 196 v_{DC}^{3} (v_{g1} - v_{g2}) - 196 v_{g1}^{3} v_{g2} - 8 \lambda^{2} v_{g2}^{2} + 49 v_{g2}^{4} + 4 v_{DC} (v_{g1} - v_{g2}) \left(-4 \lambda^{2} + 49 v_{g1}^{2} - 98 v_{g1} v_{g2} + 49 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} \left(1 v_{g1} - v_{g2} + 19 v_{g1}^{2} + 19 v_{g2}^{2}\right) + c^{4} \omega^{4} r^{4} r^{$

 $v_{g1}^{2} \left(-8 \lambda^{2} + 294 v_{g2}^{2}\right) + v_{DC}^{2} \left(-8 \lambda^{2} + 294 v_{g1}^{2} - 588 v_{g1} v_{g2} + 294 v_{g2}^{2}\right) + 4 v_{g1} \left(4 \lambda^{2} v_{g2} - 49 v_{g2}^{3}\right)\right) + c^{4} \omega^{4} R_{1}^{4} \left(\left(4 \lambda^{4} - 8 \lambda^{2} v_{DC}^{2} + 49 v_{DC}^{4}\right) (v_{g1} - v_{g2})^{2} + 9 c^{2} \omega^{2} R_{2}^{2}\right) + c^{2} \omega^{2} R_{2}^{2}$

 $\left(60 \, v_{5c}^{5} + 10 \, a^{4} \, v_{Dc} \, (v_{g1} - v_{g2}) - 80 \, a^{2} \, v_{3c}^{2} \, (v_{g1} - v_{g2}) + 120 \, v_{5c}^{5} \, (v_{g1} - v_{g2}) + a^{4} \, (v_{g1} - v_{g2})^{2} + 3 \, a^{2} \, v_{5c}^{2} \, (5 \, a^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{g2}^{2}) - 60 \, v_{bc}^{4} \, (a^{2} - v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} - v_{g2}^{2}) \right) \right) - 4 \, c^{4} \, \omega^{4} \, R_{1}^{3} \, R_{2} \, \left((v_{g1} - v_{g2})^{2} \, (4 \, a^{4} - 8 \, a^{2} \, v_{5c}^{2} + 49 \, v_{bc}^{4} + 49 \, v_{bc}^{2} \, (v_{g1} - v_{g2}) + 4 \, a^{2} \, v_{bc} \, (-v_{g1} + v_{g2}) \right) + 9 \, c^{2} \, \omega^{2} \, R_{2}^{2} \, (20 \, v_{5c}^{6} - 60 \, v_{5c}^{5} \, (v_{g1} - v_{g2})^{2} + a^{4} \, v_{bc}^{2} \, (z_{g1} - z_{g2}) + a^{4} \, (v_{g1} - v_{g2})^{2} + a^{2} \, v_{bc}^{2} \, (z_{g1} - z_{g2}) + a^{2} \, v_{bc}^{2} \, (z_{g1} - z_{g2})^{2} \, (z_{g1} - z_{g2}) + a^{2} \, v_{bc}^{2} \, (z_{g1} - z_{g2})^{2} \, (z_{g1} - z_{g2})^{2} + a^{2} \, v_{bc}^{2} \, (z_{g1} - z_{g2})^{2} \, (z_{g1} - z_{$

- $48 \, v_{g1} \, v_{g2} 24 \, v_{g2}^2 + \lambda^2 \, v_{DC} \, (v_{g1} v_{g2}) \, \left(5 \, \lambda^2 4 \, v_{g1}^2 + 8 \, v_{g1} \, v_{g2} 4 \, v_{g2}^2 \right) \\ 2 \, 0 \, v_{DC}^4 \, \left(\lambda^2 3 \, v_{g1}^2 + 6 \, v_{g1} \, v_{g2} 3 \, v_{g1}^2 \right) \\ + 2 \, 0 \, v_{DC}^2 \, \left(2 \, \lambda^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, (v_{g1} v_{g2})^4 + 2 \, C^2 \, \omega^2 \, R_2^2 \, \left(v_{g1} v_{g2}\right)^2 \, \left(49 \, v_{DC}^4 + 147 \, v_{DC}^3 \, \left(v_{g1} v_{g2}\right) + 4 \, \lambda^2 \, \left(\lambda^2 v_{g1}^2 + 2 \, v_{g1} \, v_{g2} 2 \, v_{g1}^2 \, v_{g2} + v_{g2}^2\right) \right) \\ 2 \, c^2 \, \omega^2 \, R_1 \, R_2 \, \left(2 \, \left(2 \, \lambda^2 + 7 \, v_{DC}^2 + 7 \, v_{DC} \, \left(v_{g1} v_{g2}\right)^2 + 2 \, C^2 \, \omega^2 \, R_2^2 \, \left(v_{g1} v_{g2}\right)^2 \, \left(49 \, v_{DC}^4 + 147 \, v_{DC}^3 \, \left(v_{g1} v_{g2}\right) + 4 \, \lambda^2 \, \left(\lambda^2 v_{g1}^2 + 2 \, v_{g1} \, v_{g2} v_{g2}^2\right) \right) \\ 2 \, v_{DC}^2 \, \left(v_{DC} \, v_{DC} \, v_{DC}$
 - $v_{DC} \left(v_{g1} v_{g2} \right) \left(-12 \ \text{$\lambda^2 + 49} \ v_{g1}^2 98 \ v_{g1} \ v_{g2} + 49 \ v_{g2}^2 \right) + v_{DC}^2 \left(-8 \ \text{$\lambda^2 + 147} \ v_{g1}^2 294 \ v_{g1} \ v_{g2} + 147 \ v_{g2}^2 \right) \right) + 9 \ \text{$c^4 \ \omega^4 \ R_2^4 \ (v_{DC} + v_{g1} v_{g2}) \ (v_{DC} + v_{g1} v_{g2} v_{g2}) \ (v_{DC} + v_{g1} v_{g2} v_{g2}$

 $\left(12 \ v_{5c}^{5} + 48 \ v_{4c}^{4} (v_{g1} - v_{g2}) - 12 \ v_{2c}^{2} (k^{2} - 6 \ v_{g1}^{2} + 12 \ v_{g1} \ v_{g2} - 6 \ v_{g2}^{2}) + 2 \ k^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 4 \ v_{g1}^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 4 \ v_{g1}^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 4 \ v_{g1}^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 4 \ v_{g1}^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (v_{g1} - v_{g2}) (k^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (v_{g1} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2}) + 2 \ v_{g1}^{2} (k^{2} - 2 \ v_{g1}^{2} + 2 \ v_{g1}^{2} +$

- $2 \ c^{2} \ \omega^{2} \ R_{2}^{2} \ (v_{g1} v_{g2})^{2} \ \left(147 \ v_{bc}^{4} 24 \ a^{2} \ v_{bc} \ (v_{g1} v_{g2}) + 294 \ v_{3c}^{3} \ (v_{g1} v_{g2}) 3 \ v_{bc}^{2} \ (8 \ a^{2} 49 \ v_{g1}^{2} + 98 \ v_{g1} \ v_{g2} 49 \ v_{g2}^{2}) + 4 \ a^{2} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ \omega^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ \omega^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ \omega^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ \omega^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ \omega^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2}) + 9 \ c^{4} \ (3 \ a^{2} v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2} + 2 \ v_{g1} \ v_{g1} v_{g2}^{2} + 2 \ v_{g1} \ v_{g2} v_{g2}^{2} + 2 \ v_{g1} \ v_{g1} v_{g1} \ v_{g1} v_{g1}^{2} + v_{g1}^{2} + 2 \ v_{g1} \ v_{g1} v_{g1}^{2} + v_{g1$
- $R_{2}^{4} \left(60 \, v_{DC}^{5} + 240 \, v_{DC}^{5} \left(v_{g1} v_{g2} \right) + 4 \, \lambda^{2} \, v_{DC} \left(v_{g1} v_{g2} \right) \left(5 \, \lambda^{2} 12 \, v_{g1}^{2} + 24 \, v_{g1} \, v_{g2} 12 \, v_{g2}^{2} \right) \\ 60 \, v_{DC}^{4} \left(\lambda^{2} 6 \, v_{g1}^{2} + 12 \, v_{g1} \, v_{g2} 6 \, v_{g2}^{2} \right) + 2 \, \lambda^{2} \left(v_{g1} v_{g2} \right)^{2} \left(3 \, \lambda^{2} 2 \, v_{g1}^{2} + 4 \, v_{g1} \, v_{g2} 12 \, v_{g1}^{2} \right) \\ 2 \, v_{g2}^{2} \left(+ 80 \, v_{DC}^{3} \left(v_{g1} v_{g2} \right) \left(-2 \, \lambda^{2} + 3 \, v_{g1}^{2} 6 \, v_{g1} \, v_{g2} + 3 \, v_{g2}^{2} \right) + 3 \, v_{DC}^{2} \left(5 \, \lambda^{4} + 20 \, v_{g1}^{4} 80 \, v_{g1}^{2} \, v_{g2} 48 \, \lambda^{2} \, v_{g2}^{2} + 20 \, v_{g1}^{2} 24 \, v_{g1}^{2} \left(2 \, \lambda^{2} 5 \, v_{g2}^{2} \right) + 16 \, v_{g1} \left(6 \, \lambda^{2} \, v_{g2} 5 \, v_{g2}^{2} \right) \right) \right) \right) \right)$

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 $\left(-9 \ C^{6} \ \omega^{6} \ R_{1}^{6} \ v_{DC} \ \left(\lambda^{6} - 10 \ \lambda^{4} \ v_{DC}^{2} + 24 \ \lambda^{2} \ v_{DC}^{4} - 16 \ v_{DC}^{6} \right) + 9 \ C^{6} \ \omega^{6} \ R_{1}^{5} \ R_{2} \ \left(6 \ \lambda^{6} \ v_{DC} - 60 \ \lambda^{4} \ v_{DC}^{3} + 144 \ \lambda^{2} \ v_{DC}^{5} - 96 \ v_{DC}^{7} + \lambda^{6} \ \left(v_{g1} - v_{g2}\right) - 26 \ \lambda^{4} \ v_{DC}^{2} \ \left(v_{g1} - v_{g2}\right) + 9 \ C^{6} \ \omega^{6} \ R_{1}^{5} \ R_{2} \ \left(6 \ \lambda^{6} \ v_{DC} - 60 \ \lambda^{4} \ v_{DC}^{3} + 144 \ \lambda^{2} \ v_{DC}^{5} - 96 \ v_{DC}^{7} + \lambda^{6} \ \left(v_{g1} - v_{g2}\right) - 26 \ \lambda^{4} \ v_{DC}^{3} \ \left(v_{g1} - v_{g2}\right) + 9 \ C^{6} \ \omega^{6} \ R_{1}^{5} \ R_{2} \ \left(6 \ \lambda^{6} \ v_{DC} - 60 \ \lambda^{4} \ v_{DC}^{3} + 144 \ \lambda^{2} \ v_{DC}^{5} - 96 \ v_{DC}^{7} + \lambda^{6} \ \left(v_{g1} - v_{g2}\right) + 26 \ \lambda^{6} \ v_{DC} \ v_{DC} \ \left(v_{g1} - v_{g2}\right) + 26 \ \lambda^{6} \ v_{DC} \ \left(v_{g1} - v_{g2}\right) + 26 \ \lambda^{6} \ v_{DC} \ v_{DC} \ \left(v_{g1} - v_{g2}\right) + 26 \ \lambda^{6} \ v_{DC} \ v_{DC}$ $104 \ \lambda^2 \ V_{DC}^4 \ (V_{g1} - V_{g2}) - 96 \ V_{DC}^6 \ (V_{g1} - V_{g2}) +$ $4 \, v_{\text{DC}} \, \left(v_{\text{g1}} - v_{\text{g2}} \right)^{6} + 2 \, \text{C}^{2} \, \omega^{2} \, R_{2}^{2} \, \left(v_{\text{g1}} - v_{\text{g2}} \right)^{4} \, \left(28 \, v_{\text{DC}}^{3} + 56 \, v_{\text{DC}}^{2} \, \left(v_{\text{g1}} - v_{\text{g2}} \right) + \lambda^{2} \, \left(-v_{\text{g1}} + v_{\text{g2}} \right) + 7 \, v_{\text{DC}} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} - 8 \, v_{\text{g1}} \, v_{\text{g2}} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} + 8 \, v_{\text{g1}} \, v_{\text{g2}} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g1}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right) + 2 \, v_{\text{g2}}^{2} \, \left(\lambda^{2} + 4 \, v_{\text{g2}}^{2} + 4 \, v_{\text{g2}}^{2} \right) \right)$ $2 \ C^4 \ \omega^4 \ R_1^3 \ R_2 \ \left(\left(-24 \ \lambda^4 \ V_{DC} + 116 \ \lambda^2 \ V_{DC}^3 - 392 \ V_{DC}^5 + 2 \ \lambda^4 \ (V_{g1} - V_{g2}) + 71 \ \lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2}) - 392 \ V_{DC}^4 \ (V_{g1} - V_{g2}) \right) \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 \ (V_{g1} - V_{g2})^2 + 10 \ \Lambda^2 \ V_{DC}^2 \ (V_{g1} - V_{g2})^2 \ (V_{g1} 9 C^{2} w^{2} R_{2}^{2} \left(-160 v_{DC}^{2}-480 v_{DC}^{6} (V_{g1}-V_{g2})-4 \lambda^{2} v_{DC}^{3} (25 \lambda^{2}-88 v_{g1}^{2}+176 V_{g1} V_{g2}-88 v_{g2}^{2})-2 \lambda^{2} v_{DC}^{3} (V_{g1}-V_{g2}) \left(65 \lambda^{2}-36 v_{g1}^{2}+72 v_{g1} v_{g2}-36 v_{g2}^{2}\right)+2 \lambda^{4} v_{DC} \left(5 \lambda^{2}-22 v_{g1}^{2}+44 v_{DC} (5 \lambda^{2}-22 v_{Q1}^{2}+44 v_{DC} (5 \lambda^{2}-22 v_{DC} (5 \lambda^{2}+24 v_{DC} (5$ $v_{g1} v_{g2} - 22 v_{g2}^2 + 40 v_{bc}^4 (v_{g1} - v_{g2}) \left(13 \lambda^2 - 4 v_{g1}^2 + 8 v_{g1} v_{g2} - 4 v_{g2}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(5 \lambda^2 - 3 v_{g1}^2 + 6 v_{g1} v_{g2} - 3 v_{g2}^2 \right) + 240 v_{bc}^5 \left(\lambda^2 - 2 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g2}^2 \right) \right) + 240 v_{bc}^5 \left(\lambda^2 - 2 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g2}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(5 \lambda^2 - 3 v_{g1}^2 + 6 v_{g1} v_{g2} - 3 v_{g2}^2 \right) + 240 v_{bc}^5 \left(\lambda^2 - 2 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g2}^2 \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(5 \lambda^2 - 3 v_{g1}^2 + 6 v_{g1} v_{g2} - 3 v_{g2}^2 \right) + 240 v_{bc}^5 \left(\lambda^2 - 2 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g2}^2 \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g2}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g1}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g1}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g1}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1}^2 + 4 v_{g1} v_{g2} - 2 v_{g1}^2 \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1} v_{g2} - 2 v_{g1} v_{g2} \right) + \lambda^4 \left(v_{g1} - v_{g2} \right) \left(13 \lambda^2 - 4 v_{g1} v_{g2} - 2 v_{g1} v_{g2} \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 4 v_{g1} v_{g2} \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) \right) + \lambda^4 \left(v_{g1} - v_{g2} v_{g1} + 2 v_{g1} v_{g2} \right) \right)$ $C^{4} \ \omega^{4} \ R_{1}^{4} \left(2 \ V_{DC} \ \left(6 \ \lambda^{4} - 29 \ \lambda^{2} \ V_{DC}^{2} + 98 \ V_{BC}^{4} \right) \\ (V_{g1} - V_{g2})^{2} - 9 \ C^{2} \ \omega^{2} \ R_{2}^{2} \left(-240 \ V_{DC}^{2} + 5 \ \lambda^{6} \ (V_{g1} - V_{g2}) - 130 \ \lambda^{4} \ V_{DC}^{2} \ (V_{g1} - V_{g2}) + 520 \ \lambda^{2} \ V_{DC}^{4} \ V_{g1} - V_{g2}) - 480 \ V_{BC}^{5} \ (V_{g1} - V_{g2}) - 130 \ \lambda^{4} \ V_{DC}^{2} \ (V_{g1} - V_{g2}) + 520 \ \lambda^{2} \ V_{DC}^{4} \ V_{DC} \ (V_{g1} - V_{g2}) - 130 \ \lambda^{4} \ V_{DC}^{2} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ V_{DC} \ (V_{g1} - V_{g2}) - 130 \ \lambda^{4} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) - 130 \ \lambda^{4} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4}
\ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_{g2}) + 500 \ \lambda^{2} \ V_{DC}^{4} \ (V_{g1} - V_$ $2 \ \lambda^{2} \ v_{DC}^{2} \left(75 \ \lambda^{2} - 88 \ v_{g1}^{2} + 176 \ v_{g1} \ v_{g2} - 88 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + 120 \ v_{DC}^{5} \left(3 \ \lambda^{2} - 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} - 2 \ v_{g2}^{2} \right) \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{DC} \left(15 \ \lambda^{2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{g1} \ v_{g2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{g1} \ v_{g2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} - 22 \ v_{g2}^{2} \right) \\ + \lambda^{4} \ v_{g1} \ v_{g2} - 22 \ v_{g1}^{2} + 44 \ v_{g1} \ v_{g2} + 24 \ v_{g1} \ v_{g1} \ v_{g2} + 24 \ v_{g1} \ v_{g1} + 24 \ v_{g1} \ v_{g2} + 24 \ v_{g1} \ v_{g1} + 24 \ v_{g1} \ v_{g1} \ v_{g1} + 24 \ v_{g1} \ v_{g1} \ v_{g1} \ v_{g1} \ v_{g1} + 24 \ v_{g1} \ v_$ $2 \ C^4 \ \omega^4 \ R_2^4 \ (V_{g1} - V_{g2})^2 \ (98 \ V_{5c}^5 + 392 \ V_{5c}^4 \ (V_{g1} - V_{g2}) - \lambda^2 \ (V_{g1} - V_{g2}) \ (2 \ \lambda^2 + 13 \ V_{g1}^2 - 26 \ V_{g1} \ V_{g2} + 13 \ V_{g2}^2) + V_{5c}^2 \ (V_{g1} - V_{g2}) \ (-71 \ \lambda^2 + 392 \ V_{g1}^2 - 784 \ V_{g1} \ V_{g2} + 392 \ V_{g2}^2) + V_{5c}^2 \ (V_{g1} - V_{g2}) \ (-71 \ \lambda^2 + 392 \ V_{g1}^2 - 784 \ V_{g1} \ V_{g2} + 392 \ V_{g2}^2) + V_{5c}^2 \ (V_{g1} - V_{g2}) \ (-71 \ \lambda^2 + 392 \ V_{g1}^2 - 784 \ V_{g1} \ V_{g2} + 392 \ V_{g1}^2 - 26 \ V_{g1} \ V_{g2} + 392 \ V_{g2}^2) + V_{5c}^2 \ (V_{g1} - V_{g2}) \ (-71 \ \lambda^2 + 392 \ V_{g1}^2 - 784 \ V_{g1} \ V_{g2} + 392 \ V_{g1}^2 - 26 \ V_{g1} \ V_{g2} + 392 \ V_{g2}^2) + V_{5c}^2 \ (V_{g1} - V_{g2}) \ (-71 \ \lambda^2 + 392 \ V_{g1}^2 - 784 \ V_{g1} \ V_{g2} + 392 \ V_{g1}^2 +$ $v_{35}^{5} \left(-29 \, \lambda^{2} + 588 \, v_{g1}^{2} - 1176 \, v_{g1} \, v_{g2} + 588 \, v_{g2}^{2}\right) + v_{bc} \left(6 \, \lambda^{4} + 98 \, v_{g1}^{4} - 392 \, v_{31}^{3} \, v_{g2} - 55 \, \lambda^{2} \, v_{g2}^{2} + 98 \, v_{g1}^{4} \left(-55 \, \lambda^{2} + 588 \, v_{g2}^{2}\right) + 2 \, v_{g1} \left(55 \, \lambda^{2} \, v_{g2} - 196 \, v_{32}^{2}\right)\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{32}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{32}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{32}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g2} - 196 \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}^{2}\right) + 2 \, v_{g1}^{2} \left(-55 \, \lambda^{2} \, v_{g1}$ $9 \, C^{6} \, \omega^{5} \, R^{5}_{2} \left(V_{DC} + V_{g1} - V_{g2} \right) \left(16 \, V^{5}_{DC} + 80 \, V^{5}_{DC} \left(V_{g1} - V_{g2} \right) - 8 \, V^{4}_{DC} \left(3 \, \lambda^{2} - 20 \, V^{2}_{g1} + 40 \, V_{g1} \, V_{g2} - 20 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} - 2 \, V^{2}_{g2} \right) - 80 \, V^{3}_{DC} \left(V_{g1} - V_{g2} \right) \left(\lambda^{2} - 2 \, V^{2}_{g1} + 4 \, V_{g1} \, V_{g2} \right) \right)$ $\mathbb{A}^{2} \, \left(\mathbb{A}^{4} + 8 \, \mathbb{V}_{g1}^{4} - 32 \, \mathbb{V}_{g1}^{3} \, \mathbb{V}_{g2} - 6 \, \mathbb{A}^{2} \, \mathbb{V}_{g2}^{2} + 8 \, \mathbb{V}_{g2}^{4} - 6 \, \mathbb{V}_{g1}^{2} \, \left(\mathbb{A}^{2} - 8 \, \mathbb{V}_{g2}^{2} \right) + 4 \, \mathbb{V}_{g1} \, \left(3 \, \mathbb{A}^{2} \, \mathbb{V}_{g2} - 8 \, \mathbb{V}_{g2}^{3} \right) \right) + 2 \, \mathbb{E}^{2} \,$ $2 \, v_{DC}^2 \left(5 \, \mathtt{k}^4 + 40 \, \mathtt{v_{g1}^4} - 160 \, \mathtt{v_{g1}^3} \, \mathtt{v_{g2}} - 48 \, \mathtt{k}^2 \, \mathtt{v_{g2}^2} + 40 \, \mathtt{v_{g2}^4} - 48 \, \mathtt{v_{g1}^2} \left(\mathtt{k}^2 - 5 \, \mathtt{v_{g2}^2}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} + 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} - 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} + 5 \, \mathtt{v_{g2}^3}\right) + 32 \, \mathtt{v_{g1}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}} + 5 \, \mathtt{v_{g2}^3}\right) + 32 \,
\mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt{v_{g2}} \left(3 \, \mathtt{k}^2 \, \mathtt{v_{g2}}\right) + 32 \, \mathtt$ $16 \, \text{V}_{\text{DC}} \, \left(\text{V}_{\text{g1}} - \text{V}_{\text{g2}} \right) \, \left(\text{\AA}^4 + \text{V}_{\text{g1}}^4 - 4 \, \text{V}_{\text{g1}}^3 \, \text{V}_{\text{g2}} - 3 \, \text{\AA}^2 \, \text{V}_{\text{g2}}^2 + \text{V}_{\text{g2}}^4 - 3 \, \text{V}_{\text{g1}}^2 \, \left(\text{\AA}^2 - 2 \, \text{V}_{\text{g2}}^2 \right) + \text{V}_{\text{g1}} \, \left(6 \, \text{\AA}^2 \, \text{V}_{\text{g2}} - 4 \, \text{V}_{\text{g2}}^3 \right) \right) + 2 \, \text{V}_{\text{g1}} \, \left(\text{\rassurematrix} + 1 \, \text{V}_{\text{g1}}^2 - 4 \, \text{V}_{\text{g1}}^3 \, \text{V}_{\text{g2}} - 3 \, \text{\rassurematrix}^2 + 1 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \right) + 2 \, \text{V}_{\text{g1}} \, \left(6 \, \text{\AA}^2 \, \text{V}_{\text{g2}} - 4 \, \text{V}_{\text{g2}}^3 \right) \right) + 2 \, \text{V}_{\text{g1}} \, \left(1 \, \text{\rassurematrix}^2 + 1 \, \text{V}_{\text{g1}}^2 + 1 \, \text{V}_{\text{g1}}^2 + 1 \, \text{V}_{\text{g1}}^2 + 1 \, \text{V}_{\text{g1}}^2 \right) + 2 \, \text{V}_{\text{g1}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 + 1 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \right) + 2 \, \text{V}_{\text{g1}} \, \left(1 \, \text{\rassurematrix}^2 \, \text{V}_{\text{g2}}^2 + 1 \, \text{V}_{\text{g2}}^2 + 1 \, \text{V}_{\text{g2}}^2 \right) + 2 \, \text{V}_{\text{g1}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \right) + 2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \right) + 2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 \, \text{V}_{\text{g2}}^2 + 2 \, \text{V}_{\text{g2}}^2 \, \text{V}_$ $c^{2} \, \, \omega^{2} \, R_{1}^{2} \left(14 \, v_{DC} \left(\lambda^{2} + 4 \, v_{DC}^{2} \right) \left(v_{g1} - v_{g2} \right)^{4} + 2 \, c^{2} \, \, \omega^{2} \, R_{2}^{2} \left(v_{g1} - v_{g2} \right)^{2} \left(588 \, v_{DC}^{5} - 213 \, \lambda^{2} \, v_{DC}^{2} \left(v_{g1} - v_{g2} \right) + 1176 \, v_{DC}^{4} \left(v_{g1} - v_{g2} \right) + 6 \, \lambda^{4} \left(-v_{g1} + v_{g2} \right) - 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2} \right) + 1176 \, v_{DC}^{4} \left(v_{g1} - v_{g2} \right) + 6 \, \lambda^{4} \left(-v_{g1} + v_{g2} \right) - 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2} \right) + 1176 \, v_{DC}^{4} \left(v_{g1} - v_{g2} \right) + 6 \, \lambda^{4} \left(-v_{g1} + v_{g2} \right) - 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2} \right) + 1176 \, v_{DC}^{4} \left(v_{g1} - v_{g2} \right)$ $6 \ \mathtt{V_{DC}^3} \ \left(\mathtt{29} \ \mathtt{\lambda}^2 - \mathtt{98} \ \mathtt{V_{g1}^2} + \mathtt{196} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} - \mathtt{98} \ \mathtt{V_{g2}^2} \right) \\ + \ \mathtt{\lambda}^2 \ \mathtt{V_{DC}} \ \left(\mathtt{36} \ \mathtt{\lambda}^2 - \mathtt{55} \ \mathtt{V_{g1}^2} + \mathtt{110} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} - \mathtt{55} \ \mathtt{V_{g2}^2} \right) \\ - \ \mathtt{10} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} - \mathtt{55} \ \mathtt{V_{g2}^2} \right) \\ + \ \mathtt{10} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} - \mathtt{10} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} \\ - \ \mathtt{10} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} - \mathtt{10} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} + \mathtt{10} \ \mathtt{V_{g1}} \ \mathtt{V_{g2}} + \mathtt{10} \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} \\ - \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} + \mathtt{V_{g2}} \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} + \mathtt{V_{g2}} \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} + \mathtt{V_{g2}} \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} \ \mathtt{V_{g2}} + \mathtt{V_{g2}} \ \mathtt{V_{g2}} \$ $9 C^{4} \omega^{4} R_{2}^{4} \left(-240 V_{DC}^{7} - 960 V_{DC}^{6} (V_{g1} - V_{g2}) - 4 \lambda^{2} V_{DC}^{2} (V_{g1} - V_{g2}) \right) \left(65 \lambda^{2} - 108 V_{g1}^{2} + 216 V_{g1} V_{g2} - 108 V_{g2}^{2} \right) \\ + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2} \right) + 80 V_{DC}^{4} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1} + 24 V_{g1} V_{g2} - 12 V_{g2} \right) + 80 V_{g1}^{2} (V_{g1} - V_{g2}) \left(13 \lambda^{2} - 12 V_{g1} + 24 V_{g1} V_{g1} + 24 V_{$ $2 \ \lambda^{4} \ (V_{g1} - V_{g2}) \ (5 \ \lambda^{2} - 9 \ V_{g1}^{2} + 18 \ V_{g1} \ V_{g2} - 9 \ V_{g2}^{2}) + 360 \ V_{50}^{5} \ (\lambda^{2} - 4 \ V_{g1}^{2} + 8 \ V_{g1} \ V_{g2} - 4 \ V_{g2}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2}
- 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2}) + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2} + V_{g1}^{2} + V_{g2}^{2} + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g2}^{4} + V_{g1}^{2} + V_{g1}^{2} + \lambda^{2} \ V_{bc} \ (15 \ \lambda^{4} + 56 \ V_{g1}^{4} - 224 \ V_{g1}^{3} \ V_{g2} - 132 \ \lambda^{2} \ V_{g2}^{2} + 56 \ V_{g1}^{4} + 56 \ V_{g1}^{4}$ $\left(-132 \ \lambda^{2} + 336 \ v_{g2}^{2} \right) + 8 \ v_{g1} \left(33 \ \lambda^{2} \ v_{g2} - 28 \ v_{g2}^{2} \right) \right) - 6 \ v_{Dc}^{2} \left(25 \ \lambda^{4} + 40 \ v_{g1}^{4} - 160 \ v_{g1}^{3} \ v_{g2} - 176 \ \lambda^{2} \ v_{g2}^{2} + 40 \ v_{g1}^{4} - \left(-176 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) + 32 \ v_{g1} \left(11 \ \lambda^{2} \ v_{g2} - 5 \ v_{g2}^{3} \right) \right) \right) + 2 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} + 32 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) + 32 \ v_{g1}^{2} \left(11 \ \lambda^{2} \ v_{g2} - 5 \ v_{g2}^{3} \right) \right) \right) + 2 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} + 32 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) + 32 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) \right) \right) + 3 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} + 32 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) \right) + 3 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) \right) \right) + 3 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) + 3 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) \right) + 3 \ v_{g1}^{2} \left(-126 \ \lambda^{2} + 240 \ v_{g2}^{2} \right) \right)$ $v_{5c}^{2} \left(v_{g1} - v_{g2}\right) \left(213 \ \lambda^{2} - 392 \ v_{g1}^{2} + 784 \ v_{g1} \ v_{g2} - 392 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(29 \ \lambda^{2} - 294 \ v_{g1}^{2} + 588 \ v_{g1} \ v_{g2} - 294 \ v_{g2}^{2}\right) - 2 \ \lambda^{2} \ v_{5c} \left(12 \ \lambda^{2} - 55 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 55 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ \lambda^{2} - 58 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ \lambda^{2} - 58 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ \lambda^{2} - 58 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ \lambda^{2} - 58 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g1}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g1}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} - 58 \ v_{g2}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1} \ v_{g2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{5c}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g2}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(12 \ v_{g1}^{2} + 110 \ v_{g1}^{2$ $\lambda^{2} \left(V_{g1} - V_{g2}\right) \left(6 \lambda^{2} + 13 V_{g1}^{2} - 26 V_{g1} V_{g2} + 13 V_{g2}^{2}\right) + 9 C^{4} \omega^{4} R_{2}^{4} \left(-96 V_{DC}^{2} - 480 V_{DC}^{6} \left(V_{g1} - V_{g2}\right) + 40 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 9 C^{4} \omega^{4} R_{2}^{4} \left(-96 V_{DC}^{2} - 480 V_{DC}^{6} \left(V_{g1} - V_{g2}\right) + 40 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 9 C^{4} \omega^{4} R_{2}^{4} \left(-96 V_{DC}^{2} - 480 V_{DC}^{6} \left(V_{g1} - V_{g2}\right) + 40 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 9 C^{4} \omega^{4} R_{2}^{4} \left(-96 V_{DC}^{2} - 480 V_{DC}^{6} \left(V_{g1} - V_{g2}\right) + 40 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 9 C^{4} \omega^{4} R_{2}^{4} \left(-96 V_{DC}^{2} - 480 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g2}^{2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2} - 24 V_{g1}^{2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g2}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g1}\right) + 10 V_{DC}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g1}\right) + 10 V_{G1}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g1}\right) + 10 V_{G1}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g1}\right) + 10 V_{G1}^{4} \left(V_{g1} - V_{g2}\right) \left(13 \lambda^{2} - 24 V_{g1}^{2} + 48 V_{g1} V_{g1}\right) + 10 V_{g1}^{4} \left(V_{g1} - V_{g1}\right) + 10 V_{g1}^{4}$ $48 v_{DC}^{5} \left(3 \lambda^{2} - 20 v_{g1}^{2} + 40 v_{g1} v_{g2} - 20 v_{g2}^{2}\right) + 2 \lambda^{2} v_{DC} \left(3 \lambda^{4} + 56 v_{g1}^{4} - 224 v_{g1}^{3} v_{g2} - 44 \lambda^{2} v_{g2}^{2} + 56 v_{g1}^{4} + v_{g1}^{2} \left(-44 \lambda^{2} + 336 v_{g2}^{2}\right) + 8 v_{g1} \left(11 \lambda^{2} v_{g2} - 28 v_{g1}^{3}\right)\right) - 2 v_{g1}^{2} + 4 v_{g1}^{2} v_{g2}^{2} + 5 v_{g1}^{2} + 2 v_{g2}^{2} + 5 v_{g1}^{2} + 2 v_{g1}^{2} + 2$ $4 v_{0C}^{3} \left(15 \, \lambda^{4} + 120 \, v_{g1}^{4} - 480 \, v_{g1}^{3} \, v_{g2} - 176 \, \lambda^{2} \, v_{g2}^{2} + 120 \, v_{g2}^{4} + v_{g1}^{2} \left(-176 \, \lambda^{2} + 720 \, v_{g2}^{2}\right) + 32 \, v_{g1} \left(11 \, \lambda^{2} \, v_{g2} - 15 \, v_{g2}^{3}\right)\right) \\ + \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(5 \, \lambda^{4} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2} - 18 \, \lambda^{2} \, v_{g2}^{2} + 8 \, v_{g2}^{4} - 6 \, v_{g2}^{2}\right) \\ + \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(5 \, \lambda^{4} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2} - 18 \, \lambda^{2} \, v_{g2}^{2} + 8 \, v_{g2}^{4} - 6 \, v_{g2}^{2}\right) \\ + \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(5 \, \lambda^{4} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2} - 18 \, \lambda^{2} \, v_{g2}^{2} + 8 \, v_{g2}^{4} - 6 \, v_{g2}^{2}\right) \\ + \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(5 \, \lambda^{4} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2} - 18 \, \lambda^{2} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} - 32 \, v_{g1}^{3} \, v_{g2}^{2} + 8 \, v_{g1}^{4} + 2 \, v_{g1}^{4} \, v_{g2}^{4} + 2 \, v_{g1}^{4} \, v_{g1}^{4} \, v_{g1}^{4} \, v_{g1}^{4} \, v_{g1}^{4} \, v_{g1}^{4} + 2 \, v_{g1}^{4} \, v_{g1}^{4} \, v_{g1}^{4} \, v_{g1}^{4} + 2 \, v_{g1}^{4} \, v_{g1}^{4}$ $v_{g1}^{2}\left(3\,\lambda^{2}-8\,v_{g2}^{2}\right)+4\,v_{g1}\left(9\,\lambda^{2}\,v_{g2}-8\,v_{g2}^{2}\right)\right)-2\,v_{Dc}^{2}\left(v_{g1}-v_{g2}\right)\left(65\,\lambda^{4}+48\,v_{g1}^{4}-192\,v_{g1}^{3}\,v_{g2}-216\,\lambda^{2}\,v_{g2}^{2}+48\,v_{g1}^{4}-72\,v_{g1}^{2}\left(3\,\lambda^{2}-4\,v_{g2}^{2}\right)+48\,v_{g1}\left(9\,\lambda^{2}\,v_{g2}-4\,v_{g2}^{2}\right)\right)\right)\right)/$ $\left(4\left[9\ C^{6}\ \omega^{6}\ R_{1}^{6}\ V_{DC}^{2}\ \left(\lambda^{2}-2\ V_{DC}^{2}\right)^{2}-18\ C^{6}\ \omega^{6}\ R_{1}^{5}\ R_{2}\ V_{DC}\
\left(\lambda^{2}-2\ V_{DC}^{2}\right)\ \left(3\ \lambda^{2}\ V_{DC}-6\ V_{DC}^{3}+\lambda^{2}\ \left(V_{g1}-V_{g2}\right)-6\ V_{DC}^{2}\ \left(V_{g1}-V_{g2}\right)\right)+\left(V_{g1}-V_{g2}\right)^{6}+12\left[V_{g1}^{2}-V_{g2}^{2}+V_{g2}^{2}+V_{g2}^{2}+V_{g2}^{2}+V_{g2}^{2}+V_{g2}^{2}+V_{g2}^{2}\right]$ $9 \ C^{6} \ \omega^{6} \ R_{2}^{6} \ (V_{DC} + V_{g1} - V_{g2})^{2} \ \left(\lambda^{2} - 2 \ V_{DC}^{2} - 2 \ V_{g1}^{2} - 4 \ V_{DC} \ (V_{g1} - V_{g2}) + 4 \ V_{g1} \ V_{g2} - 2 \ V_{g2}^{2}\right)^{2} + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (V_{g1} - V_{g2})^{4} \ \left(2 \ \lambda^{2} + 7 \ V_{Dc}^{2} + 7 \ V_{g1}^{2} + 14 \ V_{DC} \ (V_{g1} - V_{g2}) - 14 \ V_{g1} \ V_{g2} + 7 \ V_{g2}^{2}\right) + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (V_{g1} - V_{g2})^{4} \ \left(2 \ \lambda^{2} + 7 \ V_{Dc}^{2} + 7 \ V_{g1}^{2} + 14 \ V_{DC} \ (V_{g1} - V_{g2}) - 14 \ V_{g1} \ V_{g2} + 7 \ V_{g2}^{2}\right) + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (V_{g1} - V_{g2})^{4} \ \left(2 \ \lambda^{2} + 7 \ V_{g1}^{2} + 7 \ V_{g1}^{2} + 14 \ V_{DC} \ (V_{g1} - V_{g2}) - 14 \ V_{g1} \ V_{g2} + 7 \ V_{g2}^{2}\right) + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (V_{g1} - V_{g2})^{4} \ \left(2 \ \lambda^{2} + 7 \ V_{g1}^{2} + 14 \ V_{DC} \ (V_{g1} - V_{g2}) - 14 \ V_{g1} \ V_{g2} + 7 \ V_{g2}^{2}\right) + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (V_{g1} - V_{g2})^{4} \ \left(2 \ \lambda^{2} + 7 \ V_{g1}^{2} + 14 \ V_{DC} \ (V_{g1} - V_{g2})^{2} + 14 \ V_{g1} \ V_{g2} + 14 \ V_{g2} \ V_{g1} + 14 \ V_{g1} \ V_{g2} \ V_{g1} + 14 \ V_{g1} \ V_{g2} \ V_{g1} + 14 \ V_{g1} \ V_{g2} \ V_{g1} + 14 \ V_{g2} \ V_{g1} \ V_{g2} \ V_{g$ $C^{4} u^{4} R_{2}^{4} (V_{g1} - V_{g2})^{2} \left(4 \lambda^{4} + 49 V_{g1}^{4} + 49 V_{g1}^{4} + 196 V_{Dc}^{2} (V_{g1} - V_{g2}) - 196 V_{g1}^{3} V_{g2} - 8 \lambda^{2} V_{g2}^{2} + 49 V_{g2}^{4} + 4 V_{Dc} (V_{g1} - V_{g2}) \left(-4 \lambda^{2} + 49 V_{g1}^{4} - 98 V_{g1} V_{g2} + 49 V_{g2}^{2} + 49 V_{g2}^{4} + 4 V_{Dc} (V_{g1} - V_{g2}) V_{g2} + 49 V_{g1}^{2} - 98 V_{g1} V_{g2} + 49 V_{g2}^{2} + 49 V_{g2}^{4} + 4 V_{Dc} (V_{g1} - V_{g2}) V_{g2} + 49 V_{g1}^{2} - 98 V_{g1} V_{g2} + 49 V_{g2}^{2} + 49 V_{g2}^{2} + 40 V_{g2}$ $v_{01}^{2} \left(-8 \, \lambda^{2} + 294 \, v_{02}^{2}\right) + v_{DC}^{2} \left(-8 \, \lambda^{2} + 294 \, v_{01}^{2} - 588 \, v_{01} \, v_{02} + 294 \, v_{02}^{2}\right) + 4 \, v_{01} \left(4 \, \lambda^{2} \, v_{02} - 49 \, v_{03}^{2}\right)\right) + C^{4} \, \omega^{4} \, R_{1}^{4} \left(\left(4 \, \lambda^{4} - 8 \, \lambda^{2} \, v_{DC}^{2} + 49 \, v_{DC}^{3}\right) + 20 \, v_{DC}^{2} + 9 \, v_{DC}^{2}\right) + 20 \, v_{DC}^{2} + 9 \, v_{DC}^{2} + 20 \, v_{DC}^{2}\right) + 20 \, v_{DC}^{2} + 20 \, v_{DC}^{2}\right) + 20 \, v_{DC}^{2} + 20 \, v_{DC}^{2$ $\left(60 \, v_{DC}^{5} + 10 \, \lambda^{4} \, v_{DC} \left(v_{g1} - v_{g2} \right) - 80 \, \lambda^{2} \, v_{DC}^{3} \left(v_{g1} - v_{g2} \right) + 120 \, v_{DC}^{5} \left(v_{g1} - v_{g2} \right) + \lambda^{4} \left(v_{g1} - v_{g2} \right)^{2} + 3 \, \lambda^{2} \, v_{DC}^{2} \left(5 \, \lambda^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{DC}^{2} \right) - 60 \, v_{DC}^{4} \left(\lambda^{2} - v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} - v_{g2}^{2} \right) \right) \right) - 20 \, v_{DC}^{2} \left(\lambda^{2} - v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} - v_{g2}^{2} \right) + \lambda^{4} \left(v_{g1} - v_{g2} \right)^{2} + 3 \, \lambda^{2} \, v_{DC}^{2} \left(5 \, \lambda^{2} - 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} - 8 \, v_{DC}^{2} \right) \right)$ $4\ C^{4}\ \omega^{4}\ R_{1}^{3}\ R_{2}\ \left(\left(V_{g1}-V_{g2}\right)^{2}\ \left(4\ \lambda^{4}-8\ \lambda^{2}\ V_{DC}^{2}+49\ V_{DC}^{4}+49\ V_{DC}^{3}\right)+9\ C^{2}\ \omega^{2}\ R_{2}^{2}\ \left(20\ V_{DC}^{5}+60\ V_{DC}^{5}\ \left(V_{g1}-V_{g2}\right)+\lambda^{2}\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+20\ V_{DC}^{2}+12\ V_{DC}^{2}\right)+9\ C^{2}\ \omega^{2}\ R_{2}^{2}\ \left(20\ V_{DC}^{5}+60\ V_{DC}^{5}\ \left(V_{g1}-V_{g2}\right)+\lambda^{2}\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\right)+9\ C^{2}\ \omega^{2}\ R_{2}^{2}\ \left(20\ V_{DC}^{5}+60\ V_{DC}^{5}\ \left(V_{g1}-V_{g2}\right)+\lambda^{2}\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\right)+9\ C^{2}\ \omega^{2}\ R_{2}^{2}\ \left(20\ V_{DC}^{5}+60\ V_{DC}^{5}\ \left(V_{g1}-V_{g2}\right)+\lambda^{2}\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\right)+9\ C^{2}\ \omega^{2}\ R_{2}^{2}\ \left(20\ V_{DC}^{5}+60\ V_{DC}^{5}\ \left(V_{g1}-V_{g2}\right)+\lambda^{2}\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\right)+2\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{g1}^{2}\right)+2\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{DC}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{g1}^{2}+12\ V_{g1}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{g1}^{2}+12\ V_{g1}^{2}+12\ V_{g1}^{2}\right)+2\ V_{g1}^{2}\ \left(5\ \lambda^{2}-24\ V_{g1}^{2}+12\ V_{g$ $48 v_{g1} v_{g2} - 24 v_{g2}^2 + \lambda^2 v_{DC} (v_{g1} - v_{g2}) (5 \lambda^2 - 4 v_{g1}^2 + 8 v_{g1} v_{g2} - 4 v_{g2}^2) - 20 v_{DC}^4 (\lambda^2 - 3 v_{g1}^2 + 6 v_{g1} v_{g2} - 3 v_{g2}^2) + 20 v_{DC}^3 (v_{g1} - v_{g2}) (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2))) - (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + 20 v_{DC}^3 (v_{g1} - v_{g2}) (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2))) - (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + 20 v_{DC}^3 (v_{g1} - v_{g2}) (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2))) - (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + 20 v_{DC}^3 (v_{g1} - v_{g2}) (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2)) - (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2))) - (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2))) - (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2)) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2)) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2)) + (-2 \lambda^2 + v_{g1}^2 - 2 v_{g1} v_{g2} + v_{g2}^2) + (-2 \lambda^2 + v_{g1} v_{g2} + v_{g2} + v_{g1} v_{g2} + v_{g2} + v_{g1} v_{g2} + v_{g2} + v_{g1} v_{g2} + v_{g1} v_{g2} + v_{g2} + v_{g1} v_{g1} + v_{g1} v_{g2} + v_{g1} v_{g2} + v_{g1} v_{g1} + v$ $2 \ C^{2} \ \omega^{2} \ R_{1} \ R_{2} \ \left(2 \ \left(2 \ \lambda^{2} + 7 \ v_{DC}^{2} + 7 \ v_{DC} \ (v_{g1} - v_{g2}) \right) \ (v_{g1} - v_{g2})^{4} + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (v_{g1} - v_{g2})^{2} \ \left(49 \ v_{DC}^{4} + 147 \ v_{DC}^{3} \ (v_{g1} - v_{g2}) + 4 \ \lambda^{2} \ \left(\lambda^{2} - v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} - v_{g2}^{2}\right) + 2 \ (v_{g1} - v_{g2})^{4} + 2 \ (v_{g1} - v_{g2})^{2} \ (v_{g1} - v_{g2})^{2} \ (v_{g1} - v_{g2}) + 4 \ \lambda^{2} \ (\lambda^{2} - v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} - v_{g2}^{2}) + 2 \ (v_{g1} - v_{g2})^{2} \ (v_{g1} - v_{g$ $v_{\text{DC}} \left(v_{\text{g1}} - v_{\text{g2}} \right) \left(-12 \ \text{k}^2 + 49 \ \text{v}_{\text{g1}}^2 - 98 \ \text{v}_{\text{g1}} + 49 \ \text{v}_{\text{g2}}^2 + 49 \ \text{v}_{\text{g2}}^2 \right) + v_{\text{DC}}^2 \left(-8 \ \text{k}^2 + 147 \ \text{v}_{\text{g1}}^2 - 294 \ \text{v}_{\text{g1}} \ \text{v}_{\text{g2}} + 147 \ \text{v}_{\text{g2}}^2 \right) \right) + 9 \ \text{C}^4 \ \omega^4 \ \text{R}_2^4 \ (v_{\text{DC}} + v_{\text{g1}} - v_{\text{g2}}) = 0 \ \text{C}^4 \ \omega^4 \ \text{R}_2^4 \ (v_{\text{DC}} + v_{\text{g1}} - v_{\text{g2}}) + v_{\text{DC}}^2 \left(-8 \ \text{k}^2 + 147 \ \text{v}_{\text{g1}}^2 - 294 \ \text{v}_{\text{g1}} \ \text{v}_{\text{g2}} + 147 \ \text{v}_{\text{g2}}^2 \right) + 9 \ \text{C}^4 \ \omega^4 \ \text{R}_2^4 \ (v_{\text{DC}} + v_{\text{g1}} - v_{\text{g2}}) = 0 \ \text{C}^4 \ \omega^4 \ \text{R}_2^4 \ (v_{\text{DC}} + v_{\text{g1}} - v_{\text{g2}}) + v_{\text{g2}}^2 \left(-8 \ \text{k}^2 + 147 \ \text{k}^2 + 1$ $\left(12 \, v_{DC}^{5} + 48 \, v_{DC}^{4} \left(v_{g1} - v_{g2}\right) - 12 \, v_{DC}^{3} \left(\lambda^{2} - 6 \, v_{g1}^{2} + 12 \, v_{g1} \, v_{g2} - 6 \, v_{g2}^{2}\right) + 2 \, \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2} + 4 \, v_{D1} \, v_{g2} - 2 \, v_{g2}^{2}\right) + 4 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(-7 \, \lambda^{2} + 12 \, v_{g1}^{2} - 24 \, v_{g1} \, v_{g2} + 12 \, v_{g2}^{2}\right) + 2 \, \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2} + 4 \, v_{D1} \, v_{g2} - 2 \, v_{g2}^{2}\right) + 4 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(-7 \, \lambda^{2} + 12 \, v_{g1}^{2} - 24 \, v_{g1} \, v_{g2} + 12 \, v_{g2}^{2}\right) + 2 \, \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2} + 4 \, v_{D1} \, v_{D2} - 2 \, v_{D2}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(-7 \, \lambda^{2} + 12 \, v_{g1}^{2} - 24 \, v_{g1} \, v_{g2} + 12 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(-7 \, \lambda^{2} + 12 \, v_{g1}^{2} - 24 \, v_{g1} \, v_{g2} + 12 \, v_{g2}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right)
\left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2}\right) + 2 \, v_{DC}^$ $v_{DC}\left(3\,\lambda^{4}+12\,\nu_{g1}^{4}-48\,\nu_{g1}^{3}\,\nu_{g2}-20\,\lambda^{2}\,\nu_{g2}^{2}+12\,\nu_{g2}^{4}+\nu_{g1}^{2}\left(-20\,\lambda^{2}+72\,\nu_{g2}^{2}\right)+8\,\nu_{g1}\left(5\,\lambda^{2}\,\nu_{g2}-6\,\nu_{g2}^{3}\right)\right)\right)+c^{2}\,\omega^{2}\,\kappa_{1}^{2}\left(2\,\left(2\,\lambda^{2}+7\,\nu_{DC}^{2}\right)\,\left(\nu_{g1}-\nu_{g2}\right)^{4}+2\,\nu_{g1}^{2}+2\,\nu_{g1}^{2}+2\,\nu_{g1}^{2}+2\,\nu_{g1}^{2}\right)+2\,\nu_{g1}^{2}+2\,\nu_{g1}^$ $2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (V_{g1} - V_{g2})^{2} \ (147 \ V_{b1}^{4} - 24 \ \lambda^{2} \ V_{DC} \ (V_{g1} - V_{g2}) + 294 \ V_{b1}^{3} \ (V_{g1} - V_{g2}) - 3 \ V_{D1}^{2} \ (8 \ \lambda^{2} - 49 \ V_{g1}^{2} + 98 \ V_{g1} \ V_{g2} - 49 \ V_{g2}^{2}) + 4 \ \lambda^{2} \ (3 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g2}^{2}) + 9 \ C^{4} \ \omega^{4} \ (3 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g2}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g2}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g2}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g1}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g1}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g1}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g1}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g2}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g1}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} - V_{g1}^{2}) + 2 \ C^{4} \ (4 \ \lambda^{2} - V_{g1}^{2} + 2 \ V_{g1} \ V_{g2} \ V_{g1} \ V_{g1} \ V_{g2} \ V_{g1} \ V_{g2} \ V_{g1} \ V_{g2} \ V_{g1} \ V_{g1} \ V_{g1} \ V_{g2} \ V_{g1} \ V_{g2} \ V_{g1} \ V_{g1}$ $R_{2}^{4}\left(60\,v_{DC}^{6}+240\,v_{DC}^{5}\left(v_{g1}-v_{g2}\right)+4\,\lambda^{2}\,v_{DC}\left(v_{g1}-v_{g2}\right)\left(5\,\lambda^{2}-12\,v_{g1}^{2}+24\,v_{g1}\,v_{g2}-12\,v_{g2}^{2}\right)-60\,v_{DC}^{4}\left(\lambda^{2}-6\,v_{g1}^{2}+12\,v_{g1}\,v_{g2}-6\,v_{g2}^{2}\right)+2\,\lambda^{2}\left(v_{g1}-v_{g2}\right)^{2}\left(3\,\lambda^{2}-2\,v_{g1}^{2}+4\,v_{g1}\,v_{g2}-12\,v_{g2}^{2}\right)-60\,v_{DC}^{4}\left(\lambda^{2}-6\,v_{g1}^{2}+12\,v_{g1}\,v_{g2}-6\,v_{g2}^{2}\right)+2\,\lambda^{2}\left(v_{g1}-v_{g2}\right)^{2}\left(3\,\lambda^{2}-2\,v_{g1}^{2}+4\,v_{g1}\,v_{g2}-12\,v_{g1}^{2}\right)$ $2 v_{g2}^{2} + 80 v_{DC}^{3} (v_{g1} - v_{g2}) (-2 k^{2} + 3 v_{g1}^{2} - 6 v_{g1} v_{g2} + 3 v_{g2}^{2}) + 3 v_{DC}^{2} (5 k^{4} + 20 v_{g1}^{4} - 80 v_{g1}^{3} v_{g2} - 48 k^{2} v_{g2}^{2} + 20 v_{g2}^{4} - 24 v_{g1}^{2} (2 k^{2} - 5 v_{g2}^{2}) + 16 v_{g1} (6 k^{2} v_{g2} - 5 v_{g2}^{3})))))$

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 $-\left[\texttt{A C } \omega \ \left(-\texttt{R_{1} V_{DC} + \texttt{R_{2} (V_{DC} + \texttt{V}_{g1} - \texttt{V}_{g2})} \right) \ \left(\texttt{V}_{g1} - \texttt{V}_{g2} \right) \ \left(\texttt{9 C}^{4} \ \omega^{4} \ \texttt{R_{1}^{4}} \ \left(\texttt{A}^{4} - \texttt{6} \ \texttt{A}^{2} \ \texttt{V}_{DC}^{2} + \texttt{8} \ \texttt{V}_{DC}^{4} \right) \\ + 2 \ \left(\texttt{V}_{g1} - \texttt{V}_{g2} \right)^{4} + 2 \ \texttt{C}^{2} \ \omega^{2} \ \texttt{R_{2}^{2}} \ \left(\texttt{V}_{g1} - \texttt{V}_{g2} \right)^{2} \\ + 2 \ \texttt{C}^{2} \ \texttt{A}^{2} \ \texttt{A}^$

 $\left(2 \, \lambda^{2} + 13 \, v_{DC}^{2} + 13 \, v_{DL}^{2} + 26 \, v_{DC} \left(v_{g1} - v_{g2}\right) - 26 \, v_{g1} \, v_{g2} + 13 \, v_{g2}^{2}\right) - 36 \, C^{4} \, \omega^{4} \, R_{1}^{3} \, R_{2} \left(\lambda^{4} - 6 \, \lambda^{2} \, v_{DC}^{2} + 8 \, v_{DC}^{4} + 8 \, v_{DC}^{3} + 8 \, v_{$

 $9 C^4 \omega^4 R_2^4 \left(\lambda^4 + 8 v_{DC}^4 + 8 v_{g1}^4 + 32 v_{DC}^3 \left(v_{g1} - v_{g2}\right) - 32 v_{g1}^3 v_{g2} - 6 \lambda^2 v_{g2}^2 + 8 v_{g2}^4 - 6 v_{g1}^2 \left(\lambda^2 - 8 v_{g2}^2\right) - 6 v_{DC}^2 \left(\lambda^2 - 8 v_{g1}^2 + 16 v_{g1} v_{g2} - 8 v_{g2}^2\right) + 6 v_{g1}^2 v_{g2}^2 + 8 v_{g2}^4 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g1}^4 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g2}^4 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g1}^4 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g2}^4 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g2}^4 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g1}^4 + 16 v_{g1}^2 + 16 v_{g1}^2 v_{g2}^2 + 8 v_{g1}^4 + 16 v_{g1}^2 + 16 v_{$

 $4 v_{DC} \left(v_{g1} - v_{g2}\right) \left(-3 \lambda^{2} + 8 v_{g1}^{2} - 16 v_{g1} v_{g2} + 8 v_{g2}^{2}\right) + 4 v_{g1} \left(3 \lambda^{2} v_{g2} - 8 v_{g2}^{2}\right)\right) - 4 c^{2} \omega^{2} R_{1} R_{2} \left(\left(2 \lambda^{2} + 13 v_{DC}^{2} + 13 v_{DC} (v_{g1} - v_{g2})\right) (v_{g1} - v_{g2})^{2} + 3 v_{g2}^{2} + 4 v_{g1} \left(3 \lambda^{2} v_{g2} - 8 v_{g2}^{2}\right)\right) - 4 c^{2} \omega^{2} R_{1} R_{2} \left(\left(2 \lambda^{2} + 13 v_{DC}^{2} + 13 v_{DC} (v_{g1} - v_{g2})\right) (v_{g1} - v_{g2})^{2} + 3 v_{g2}^{2} + 3 v_{g2}^{2} + 3 v_{g2}^{2} + 3 v_{g2}^{2}\right) + 4 v_{g1} \left(3 \lambda^{2} v_{g2} - 8 v_{g2}^{2}\right) + 4 v_{g2} \left(2 \lambda^{2} + 13 v_{DC} (v_{g1} - v_{g2}) + 3 v_{g2} + 3 v_{g2}^{2} + 3 v_{g2}^{2}\right) + 4 v_{g1} \left(3 \lambda^{2} v_{g2} - 8 v_{g2}^{2}\right) + 4 v_{g2} \left(3 \lambda^{2} + 3 v_{g2} + 3$

 $9 C^{2} \omega^{2} R_{2}^{2} \left(8 V_{DC}^{4} + 24 V_{DC}^{3} (V_{g1} - V_{g2}) - 6 V_{DC}^{2} (k^{2} - 4 V_{g1}^{2} + 8 V_{g1} V_{g2} - 4 V_{g2}^{2}) + k^{2} (k^{2} - 3 V_{g1}^{2} + 6 V_{g1} V_{g2} - 3 V_{g2}^{2}) + V_{DC} (V_{g1} - V_{g2}) (-9 k^{2} + 8 V_{g1}^{2} - 16 V_{g1} V_{g2} - 4 V_{g1}^{2} + 8 V_{g1}^{2} V_{g2} - 4 V_{g2}^{2}) + k^{2} (k^{2} - 3 V_{g1}^{2} + 6 V_{g1} V_{g2} - 3 V_{g2}^{2}) + V_{DC} (V_{g1} - V_{g2}) (-9 k^{2} + 8 V_{g1}^{2} - 16 V_{g1} V_{g2} - 4 V_{g2}^{2} + 8 V_{g1}^{2} + 8 V_{g1} V_{g2} - 4 V_{g2}^{2}) + k^{2} (k^{2} - 3 V_{g1}^{2} + 6 V_{g1} V_{g2} - 3 V_{g2}^{2}) + V_{DC} (V_{g1} - V_{g2}) (-9 k^{2} + 8 V_{g1}^{2} - 16 V_{g1} V_{g2} - 4 V_{g2}^{2} + 8 V_{g1}^{2} + 8 V_{g1}^{2$

 $\left(\left(2\,\lambda^{2}+13\,\nu_{DC}^{2}\right)\left(\nu_{g1}-\nu_{g2}\right)^{2}+27\,c^{2}\,\omega^{2}\,R_{2}^{2}\left(\vartheta\,\nu_{DC}^{4}+16\,\nu_{DC}^{3}\left(\nu_{g1}-\nu_{g2}\right)+6\,\lambda^{2}\,\nu_{DC}\left(-\nu_{g1}+\nu_{g2}\right)+\lambda^{2}\left(\lambda^{2}-\nu_{g1}^{2}+2\,\nu_{g1}\,\nu_{g2}-\nu_{g2}^{2}\right)+\nu_{DC}^{2}\left(-6\,\lambda^{2}+8\,\nu_{g1}^{2}-16\,\nu_{g1}\,\nu_{g2}+8\,\nu_{g2}^{2}\right)\right)\right)\right)/2$

 $\left(2 \left(9 \operatorname{C}^{6} \operatorname{\omega}^{6} \operatorname{R}_{1}^{6} \operatorname{V}_{DC}^{2} \left(\mathbb{A}^{2} - 2 \operatorname{V}_{DC}^{2}\right)^{2} - 18 \operatorname{C}^{6} \operatorname{\omega}^{6} \operatorname{R}_{1}^{5} \operatorname{R}_{2} \operatorname{V}_{DC} \left(\mathbb{A}^{2} - 2 \operatorname{V}_{DC}^{2}\right) \left(3 \operatorname{A}^{2} \operatorname{V}_{DC} - 6 \operatorname{V}_{DC}^{3} + \operatorname{A}^{2} \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right) - 6 \operatorname{V}_{DC}^{2} \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right)\right) + \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1} - \operatorname{V}_{g2}\right)^{6} + \left(\operatorname{V}_{g1}$

 $9 c^{5} \omega^{6} R_{2}^{6} (v_{DC} + v_{g1} - v_{g2})^{2} \left(\lambda^{2} - 2 v_{DC}^{2} - 2 v_{g1}^{2} - 4 v_{DC} (v_{g1} - v_{g2}) + 4 v_{g1} v_{g2} - 2 v_{g2}^{2}\right)^{2} + 2 c^{2} \omega^{2} R_{2}^{2} (v_{g1} - v_{g2})^{4} \left(2 \lambda^{2} + 7 v_{DC}^{2} + 14 v_{DC} (v_{g1} - v_{g2}) - 14 v_{g1} v_{g2} + 7 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(4 \lambda^{4} + 49 v_{DC}^{4} + 49 v_{g1}^{4} + 196 v_{DC}^{3} (v_{g1} - v_{g2}) - 196 v_{g1}^{3} v_{g2} - 8 \lambda^{2} v_{g2}^{2} + 49 v_{g1}^{4} + 4 v_{DC} (v_{g1} - v_{g2}) \left(-4 \lambda^{2} + 49 v_{g1}^{2} - 88 v_{g1} v_{g2} + 49 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(4 \lambda^{4} + 49 v_{DC}^{4} + 49 v_{g1}^{4} + 196 v_{DC}^{3} (v_{g1} - v_{g2}) - 196 v_{g1}^{3} v_{g2} - 8 \lambda^{2} v_{g2}^{2} + 49 v_{g1}^{4} + 4 v_{DC} (v_{g1} - v_{g2}) \left(-4 \lambda^{2} + 49 v_{g1}^{2} - 88 v_{g1} v_{g2} + 49 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 49 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 49 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 49 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g2}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 49 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 49 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 98 v_{g1}^{2} + 98 v_{g1}^{2}\right) + c^{4} \omega^{4} R_{2}^{4} (v_{g1} - v_{g2})^{2} \left(-4 \lambda^{2} + 98 v_{g1}^{2} + 98 v_{g1}$

 $v_{g1}^{2} \left(-8 \ \lambda^{2} + 294 \ v_{g2}^{2}\right) + v_{DC}^{2} \left(-8 \ \lambda^{2} + 294 \ v_{g1}^{2} - 588 \ v_{g1} \ v_{g2} + 294 \ v_{g2}^{2}\right) + 4 \ v_{g1} \left(4 \ \lambda^{2} \ v_{g2} - 49 \ v_{g2}^{2}\right) + C^{4} \ \omega^{4} \ R_{1}^{4} \left(\left(4 \ \lambda^{4} - 8 \ \lambda^{2} \ v_{DC}^{2} + 49 \ v_{DC}^{2}\right) \left(v_{g1} - v_{g2}\right)^{2} + 9 \ C^{2} \ \omega^{2} \ R_{2}^{2} + 294 \ v_{g2}^{2} +$

- $\left(60 \, v_{DC}^6 + 10 \, \text{\AA}^4 \, v_{DC} \, (v_{g1} v_{g2}) 80 \, \text{\AA}^2 \, v_{DC}^3 \, (v_{g1} v_{g2}) + 120 \, v_{DC}^5 \, (v_{g1} v_{g2}) + \text{\AA}^4 \, (v_{g1} v_{g2})^2 + 3 \, \text{\AA}^2 \, v_{DC}^2 \, (5 \, \text{\AA}^2 8 \, v_{g1}^2 + 16 \, v_{g1} \, v_{g2} 8 \, v_{g2}^2) 60 \, v_{DC}^4 \, (\text{\AA}^2 v_{g1}^2 + 2 \, v_{g1} \, v_{g2} v_{g2}^2)) \right) 10 \, \text{\AA}^2 \, v_{DC}^2 \, (v_{g1} v_{g2}) + 120 \, v_{DC}^5 \, (v_{g1} v_{g2}) + 140 \, v_{g2}^2 8 \, v_{g1}^2 + 16 \, v_{g1} \, v_{g2} 8 \, v_{g2}^2) 60 \, v_{DC}^4 \, (\text{\AA}^2 v_{g1}^2 + 2 \, v_{g1} \, v_{g2} v_{g2}^2))$
- $4 \ C^4 \ \omega^4 \ R_1^3 \ R_2 \left((v_{g_1} v_{g_2})^2 \left(4 \ \lambda^4 8 \ \lambda^2 \ v_{Dc}^2 + 49 \ v_{Dc}^4 + 9 \ v_{Dc}^3 \left(v_{g_1} v_{g_2} \right) + 4 \ \lambda^2 \ v_{Dc} \left(-v_{g_1} + v_{g_2} \right) \right) + 9 \ C^2 \ \omega^2 \ R_2^2 \left(20 \ v_{Dc}^2 + 60 \ v_{Dc}^5 \left(v_{g_1} v_{g_2} \right) + \lambda^4 \ (v_{g_1} v_{g_2})^2 + \lambda^2 \ v_{Dc}^2 \left(5 \ \lambda^2 24 \ v_{g_1}^2 + 8 \ v_{g_1} + 8 \ v_{g_1} + 8 \ v_{g_1} + 9 \ v_{g_2} 24 \ v_{g_2}^2 \right) + 20 \ v_{Dc}^3 \left(v_{g_1} v_{g_2} \right) \left(-2 \ \lambda^2 + v_{g_1}^2 2 \ v_{g_2}^2 \right) \right) 20 \ v_{Dc}^4 \left(\lambda^2 3 \ v_{g_1}^2 + 6 \ v_{g_1} + 20 \ v_{Dc}^3 \left(v_{g_1} v_{g_2} \right) \left(-2 \ \lambda^2 + v_{g_1}^2 2 \ v_{g_2}^2 + v_{g_2}^2 \right) \right) 20 \ v_{Dc}^4 \left(\lambda^2 3 \ v_{g_1}^2 + 6 \ v_{g_1} + 20 \ v_{Dc}^3 \left(v_{g_1} v_{g_2} \right) \left(-2 \ \lambda^2 + v_{g_1}^2 2 \ v_{g_1} + v_{g_2}^2 \right) \right) \right) 20 \ v_{Dc}^4 \left(\lambda^2 3 \ v_{g_1}^2 + 6 \ v_{g_1} + 20 \ v_{Dc}^3 \left(v_{g_1} v_{g_2} \right) \left(-2 \ \lambda^2 + v_{g_1}^2 2 \ v_{g_1} + v_{g_2}^2 \right) \right) \right)$
- $2 C^{2} \omega^{2} R_{1} R_{2} \left(2 \left(2 A^{2} + 7 V_{DC}^{2} + 7 V_{DC} (V_{g1} V_{g2})\right) (V_{g1} V_{g2})^{4} + 2 C^{2} \omega^{2} R_{2}^{2} (V_{g1} V_{g2})^{2} \left(4 9 V_{DC}^{4} + 147 V_{DC}^{3} (V_{g1} V_{g2}) + 4 A^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} (V_{g1} V_{g2})^{4} + 2 C^{2} \omega^{2} R_{2}^{2} (V_{g1} V_{g2})^{2} \left(4 9 V_{DC}^{4} + 147 V_{DC}^{3} (V_{g1} V_{g2}) + 4 A^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} (V_{g1} V_{g2})^{4} + 2 C^{2} \omega^{2} R_{2}^{2} (V_{g1} V_{g2})^{2} \left(4 9 V_{DC}^{4} + 147 V_{DC}^{3} (V_{g1} V_{g2}) + 4 A^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} (V_{g1} V_{g2})^{4} + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2}\right)^{2} \left(4 9 V_{DC}^{4} + 147 V_{DC}^{3} (V_{g1} V_{g2}) + 4 A^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} (V_{g1} V_{g2})^{4} + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2}\right)^{2} \left(4 9 V_{DC}^{4} + 147 V_{DC}^{3} (V_{g1} V_{g2}) + 4 A^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} (V_{g1} V_{g2})^{4} + 2 C^{2} \omega^{2} R_{2}^{2} \left(V_{g1} V_{g2}\right)^{2} \left(4 8 V_{DC}^{4} + 147 V_{DC}^{3} + 147 V_{DC}^{3}\right) + 4 R^{2} \left(A^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + V_{DC} (V_{g1} V_{g2})^{4} \left(A^{2} V_{g1}^{2} + 147 V_{DC}^{3} + 147 V_{DC}^{3}\right) + 4 R^{2} \left(A^{2} V_{g1}^{2} + 147 V_{DC}^{3}\right) + 4 R^{2} \left(A^{2} V_{g1}^{2} + 147 V_{DC}^{3}\right) + 2 R^{2} \left(A^{2} V_{DC}^{2} + 147 V_{DC}^{3}\right) + 2 R^{2} \left(A^{2} V_{Q1}^{2} + 147 V_{DC}^{3}\right) +$
 - $(V_{g1} V_{g2}) \left(-12 \ \lambda^2 + 49 \ V_{g1}^2 98 \ V_{g1} \ V_{g2} + 49 \ V_{g2}^2 \right) + V_{DC}^2 \left(-8 \ \lambda^2 + 147 \ V_{g1}^2 294 \ V_{g1} \ V_{g2} + 147 \ V_{g2}^2 \right) \right) + 9 \ C^4 \ \omega^4 \ R_2^4 \ (V_{DC} + V_{g1} V_{g2})$
 - $\left(12 \ v_{DC}^{5} + 48 \ v_{DC}^{4} \left(v_{g1} v_{g2}\right) 12 \ v_{DC}^{2} \left(\lambda^{2} 6 \ v_{g1}^{2} + 12 \ v_{g1} \ v_{g2} 6 \ v_{g2}^{2}\right) + 2 \ \lambda^{2} \left(v_{g1} v_{g2}\right) \left(\lambda^{2} 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} 2 \ v_{g2}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} 24 \ v_{g1} \ v_{g2} + 12 \ v_{g2}^{2}\right) + 2 \ \lambda^{2} \left(v_{g1} v_{g2}\right) \left(\lambda^{2} 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} 2 \ v_{g1}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} 24 \ v_{g1} \ v_{g2} + 12 \ v_{g2}^{2}\right) + 4 \ v_{DC}^{2} \left(\lambda^{2} 2 \ v_{g1}^{2} + 4 \ v_{g1} \ v_{g2} 2 \ v_{g1}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} 24 \ v_{g1} \ v_{g2} + 12 \ v_{g2}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} 24 \ v_{g1} \ v_{g2} + 12 \ v_{g2}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} 24 \ v_{g1} \ v_{g2} + 12 \ v_{g2}^{2}\right) + 4 \ v_{DC}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} + 12 \ v_{g1}^{2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} + 12 \ v_{g1}^{2}\right) + 4 \ v_{g1}^{2} \left(v_{g1} v_{g2}\right) \left(-7 \ \lambda^{2} + 12 \ v_{g1}^{2} + 12 \ v_{g1}^{2}\right) \left(-7 \ \lambda^{2} + 1$

 $v_{\text{DC}}\left(3\,\text{\AA}^{4}+12\,v_{g1}^{4}-48\,v_{g1}^{3}\,v_{g2}-20\,\text{\AA}^{2}\,v_{g2}^{2}+12\,v_{g2}^{4}+v_{g1}^{2}\left(-20\,\text{\AA}^{2}+72\,v_{g2}^{2}\right)+8\,v_{g1}\left(5\,\text{\AA}^{2}\,v_{g2}-6\,v_{g2}^{3}\right)\right)\right)+c^{2}\,\omega^{2}\,\text{R}_{1}^{2}\left(2\left(2\,\text{\AA}^{2}+7\,v_{\text{DC}}^{2}\right)\,\left(v_{g1}-v_{g2}\right)^{4}+22\,v_{g1}^{2}+22\,v_{g1}^{2}+22\,v_{g1}^{2}+22\,v_{g1}^{2}\right)+22\,v_{g1}^{2}+22$

- $2 c^{2} \omega^{2} R_{2}^{2} (V_{g1} V_{g2})^{2} \left(147 V_{DC}^{4} 24 \lambda^{2} V_{DC} (V_{g1} V_{g2}) + 294 V_{DC}^{3} (V_{g1} V_{g2}) 3 V_{DC}^{2} (8 \lambda^{2} 49 V_{g1}^{2} + 98 V_{g1} V_{g2} 49 V_{g2}^{2}) + 4 \lambda^{2} \left(3 \lambda^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + 9 c^{4} \omega^{4} 2 (4 \lambda^{2} V_{DC} (V_{g1} V_{g2}) + 2 \lambda^{2} V_{DC} (V_{g1} V_{g2}) 3 V_{DC}^{2} (8 \lambda^{2} 49 V_{g1}^{2} + 98 V_{g1} V_{g2} 49 V_{g2}^{2}) + 4 \lambda^{2} \left(3 \lambda^{2} V_{g1}^{2} + 2 V_{g1} V_{g2} V_{g2}^{2}\right) + 9 c^{4} \omega^{4} 2 V_{g1} V_{g2} 2 V_{g1} V_{g1} V_{g2} 2 V_{g1} V_{g2} 2 V_{g1} V_{g1} V_{g2} 2 V_{g1} V_{g2} 2 V_{g1} V_{g2} 2 V_{g1} V_{g2} 2 V_{g1} V_{g1} V_{g2} 2 V_{g1} V_{g1} V_{g2} 2 V_{g1} V_{g1} V_{g2} 2 V_{g1} V_{g1} V_{g1} 2 V_{g1} V_{g1} 2 V_{g1} V_{g1} 2 V_{g1} V_{g1} V_{g1} 2 V_{g1}$
- $\mathbb{R}_{2}^{4} \left(60 \, v_{DC}^{6} + 240 \, v_{DC}^{5} \left(v_{g1} v_{g2} \right) + 4 \, \mathbb{A}^{2} \, v_{DC} \left(v_{g1} v_{g2} \right) + 3 \, \mathbb{A}^{2} \, v_{DC} \left(v_{g1} v_{g2} \right) \left(5 \, \mathbb{A}^{2} 12 \, v_{g1}^{2} + 24 \, v_{g1} \, v_{g2} 12 \, v_{g2}^{2} \right) \\ 2 \, v_{g2}^{2} \right) + 80 \, v_{DC}^{3} \left(v_{g1} v_{g2} \right) \left(-2 \, \mathbb{A}^{2} + 3 \, v_{g1}^{2} 6 \, v_{g1} + 2 \, v_{g1}^{2} + 3 \, v_{g2}^{2} \right) \\ 3 \, v_{DC}^{2} \left(5 \, \mathbb{A}^{4} + 20 \, v_{g1}^{4} 80 \, v_{g1}^{3} \, v_{g2}^{2} 42 \, v_{g1}^{2} \right) \\ + 2 \, v_{g2}^{2} + 20 \, v_{g2}^{2} 24 \, v_{g1}^{2} \left(2 \, \mathbb{A}^{2} 5 \, v_{g2}^{2} \right) \\ + 16 \, v_{g1} \, v_{g2} 80 \, v_{g1}^{3} \, v_{g2}^{2} + 20 \, v_{g2}^{2} + 20 \, v_{g2}^{2} 24 \, v_{g1}^{2} \left(2 \, \mathbb{A}^{2} 5 \, v_{g2}^{2} \right) \\ + 16 \, v_{g1} \, \left(6 \, \mathbb{A}^{2} \, v_{g2} 5 \, v_{g2}^{2} \right) \\ + 3 \, v_{g2}^{2} \left(5 \, \mathbb{A}^{4} + 20 \, v_{g1}^{4} 80 \, v_{g1}^{3} \, v_{g2}^{2} + 20 \, v_{g2}^{2} 24 \, v_{g1}^{2} \left(2 \, \mathbb{A}^{2} 5 \, v_{g2}^{2} \right) \\ + 16 \, v_{g1} \, \left(6 \, \mathbb{A}^{2} \, v_{g2} 5 \, v_{g2}^{2} \right) \\ + 3 \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} + 20 \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} + 20 \, v_{g2}^{2} + 20 \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} + 20 \, v_{g2}^{2} + 20 \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} + 20 \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} + 20 \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g2}^{2} + 20 \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} \, v_{g1}^$

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- $\left(3 \ \lambda^2 \ C^2 \ \omega^2 \ \left(R_1 R_2\right) \ \left(R_1 \ V_{DC} R_2 \ \left(V_{DC} + V_{g1} V_{g2}\right) \ \left(V_{g1} V_{g2}\right)^2 \ \left(C^2 \ \omega^2 \ R_1^2 \ \left(\lambda^2 9 \ V_{DC}^2 \ R_1 \ R_2 \ \left(\lambda^2 9 \ V_{DC}^2 9 \ V_{DC} \ \left(V_{g1} V_{g2}\right) \ \right) \left(V_{g1} V_{g2}\right)^2 + C^2 \ \omega^2 \ R_2^2 \ \left(\lambda^2 9 \ V_{DC}^2 9 \ V_{g1}^2 18 \ V_{DC} \ \left(V_{g1} V_{g2}\right) + 18 \ V_{g1} \ V_{g2} 9 \ V_{g2}^2 \right) \right) \right) \right)$
- $\left(2\left(9C^{6}\omega^{6}R_{1}^{6}V_{DC}^{2}\left(A^{2}-2V_{DC}^{2}\right)^{2}-18C^{6}\omega^{6}R_{1}^{5}R_{2}V_{DC}\left(A^{2}-2V_{DC}^{2}\right)\left(3A^{2}V_{DC}-6V_{DC}^{3}+A^{2}\left(V_{g1}-V_{g2}\right)-6V_{DC}^{2}\left(V_{g1}-V_{g2}\right)\right)+(V_{g1}-V_{g2})^{6}+(V_{g1}-V$
- $9 C^{6} \omega^{6} R_{2}^{6} (V_{DC} + V_{g1} V_{g2})^{2} \left(\lambda^{2} 2 V_{DC}^{2} 2 V_{g1}^{2} 4 V_{DC} (V_{g1} V_{g2}) + 4 V_{g1} V_{g2} 2 V_{g2}^{2}\right)^{2} + 2 C^{2} \omega^{2} R_{2}^{2} (V_{g1} V_{g2})^{4} \left(2 \lambda^{2} + 7 V_{DC}^{2} + 14 V_{DC} (V_{g1} V_{g2}) 14 V_{g1} V_{g2} + 7 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} (V_{g1} V_{g2})^{2} \left(4 \lambda^{4} + 49 V_{pL}^{4} + 49 V_{q1}^{4} + 19 V_{DC}^{4} + 49 V_{g1}^{2} + 19 V_{g2}^{2}\right) 16 V_{g1}^{3} V_{g2} 8 \lambda^{2} V_{g2}^{2} + 4 9 V_{g1}^{4} + 4 9 V_{g1}^{2} 98 V_{g1} V_{g2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} (V_{g1} V_{g2})^{2} \left(4 \lambda^{4} + 49 V_{pL}^{4} + 49 V_{q1}^{4} + 49 V_{q2}^{2} 98 V_{g1} + 19 V_{q2}^{2}\right) 16 V_{g1}^{3} V_{g2} 8 \lambda^{2} V_{g2}^{2} + 4 V_{DC} (V_{g1} V_{g2})^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} 98 V_{g1} V_{g2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} 98 V_{g1} V_{g2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g2}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{4} R_{2}^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{4} \left(V_{g1} V_{g2}\right)^{2} \left(-4 \lambda^{2} + 49 V_{g1}^{2}\right) + C^{4} \omega^{$
- $v_{g1}^{2} \left(-8 \ \text{\AA}^{2} + 294 \ \text{V}_{g2}^{2}\right) + v_{DC}^{2} \left(-8 \ \text{\AA}^{2} + 294 \ \text{V}_{g1}^{2} 588 \ \text{V}_{g1} \ \text{V}_{g2} + 294 \ \text{V}_{g2}^{2}\right) + 4 \ \text{V}_{g1} \left(4 \ \text{\AA}^{2} \ \text{V}_{g2} 49 \ \text{V}_{g2}^{3}\right)\right) + c^{4} \ \omega^{4} \ \text{R}_{1}^{4} \left(\left(4 \ \text{\AA}^{4} 8 \ \text{\AA}^{2} \ \text{V}_{DC}^{2} + 49 \ \text{V}_{DC}^{4}\right) (\text{V}_{g1} \text{V}_{g2})^{2} + 9 \ \text{C}^{2} \ \omega^{2} \ \text{R}_{2}^{2}$
- $\left(60 \, v_{DC}^{5} + 10 \, \mathbb{A}^{4} \, v_{DC} \, (v_{g1} v_{g2}) 80 \, \mathbb{A}^{2} \, v_{DC}^{3} \, (v_{g1} v_{g2}) + 120 \, v_{DC}^{5} \, (v_{g1} v_{g2}) + \mathbb{A}^{4} \, (v_{g1} v_{g2})^{2} + 3 \, \mathbb{A}^{2} \, v_{DC}^{2} \, (5 \, \mathbb{A}^{2} 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} 8 \, v_{g2}^{2}) 60 \, v_{DC}^{4} \, \left(\mathbb{A}^{2} v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} v_{g2}^{2} \right) \right) \right) \\ + c^{4} \, \omega^{4} \, w_{R_{1}^{3} \, R_{2}} \, \left((v_{g1} v_{g2})^{2} \, (4 \, \mathbb{A}^{4} 8 \, \mathbb{A}^{2} \, v_{DC}^{2} + 49 \, v_{DC}^{3} \, (v_{g1} v_{g2}) + 4 \, \mathbb{A}^{2} \, v_{DC} \, (-v_{g1} + v_{g2}) \right) + 9 \, c^{2} \, \omega^{2} \, R_{2}^{2} \, \left(20 \, v_{DC}^{5} + 60 \, v_{DC}^{5} \, (v_{g1} v_{g2}) + \mathbb{A}^{4} \, (v_{g1} v_{g2})^{2} + \mathbb{A}^{2} \, v_{DC}^{2} \, (5 \, \mathbb{A}^{2} 24 \, v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} 24 \, v_{g1}^{2} + 2 \, v_{g1} \, v_{g2} \, v_{g1}^{2} + 2 \, v_{g1} \, v_{g2}^{2} 24 \, v_{g1}^{2} + 2 \, v_{g1} \, v_{g2}^{2} + 2 \, v_{g1} \, v_{g2}^{2} + 2 \, v_{g1}^{2} \, v_{g2}^{2} \right) \right) \\ + c^{2} \, \omega^{2} \, w_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} + 2 \, v_{g1}^{2} \, v_{g2}^{2} + 2 \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} + 2 \, v_{g1}^{2} \, v_{g2}^{2} \, v_{g1}^{2} + 2 \, v_{g1}^{2} \,$
- $48 \ v_{g1} \ v_{g2} 24 \ v_{g2}^2 \right) + k^2 \ v_{DC} \ (v_{g1} v_{g2}) \ \left(5 \ k^2 4 \ v_{g1}^2 + 8 \ v_{g1} \ v_{g2} 4 \ v_{g2}^2 \right) 20 \ v_{DC}^4 \left(k^2 3 \ v_{g1}^2 + 6 \ v_{g1} \ v_{g2} 3 \ v_{g2}^2 \right) + 20 \ v_{DC}^2 \left(v_{g1} v_{g2} \right) \ \left(-2 \ k^2 + v_{g1}^2 2 \ v_{g1} \ v_{g2} + v_{g2}^2 \right) \right) \right) 2 \ c^2 \ \omega^2 \ R_1 \ R_2 \ \left(2 \ \left(2 \ k^2 7 \ v_{DC}^2 + 7 \ v_{DC} \ v_{g1} v_{g2} \right)^2 \left(49 \ v_{DC}^4 + 17 \ v_{DC}^3 \ (v_{g1} v_{g2}) + 4 \ k^2 \left(k^2 v_{g1}^2 + 2 \ v_{g1} \ v_{g2} v_{g2}^2 \right) + 0 \ v_{DC}^2 \left(49 \ v_{DC}^4 + 17 \ v_{DC}^3 \ (v_{g1} v_{g2}) + 4 \ k^2 \left(k^2 v_{g1}^2 + 2 \ v_{g1} \ v_{g2} v_{g2}^2 \right) + 0 \ v_{DC}^2 \left(v_{DC}^2 + v_{DC}^2 + v_{DC}^2 + v_{DC}^2 \right) + 0 \ v_{DC}^2 \left(v_{g1} v_{g2} + v_{g1}^2 + 2 \ v_{g1} \ v_{g2} v_{g2}^2 \right) + 0 \ v_{DC}^2 \left(v_{g1} v_{g2} + v_{g2}^2 + v_{DC}^2 \right) + 0 \ v_{DC}^2 \left(v_{g1} v_{g2} + v_{g1}^2 + 2 \ v_{g1} \ v_{g2} v_{g2}^2 \right) + 0 \ v_{DC}^2 \left(v_{DC} v_{DC} \ v_{DC} + 14 \ v_{DC}^2 + v_{DC}^2 + 12 \ v_{DC}^2 + v_{DC}^2 + v_{DC}^2 \right) + 0 \ v_{DC}^2 \left(v_{g1} v_{g2} + v_{g2} + v_{DC}^2 + v_{DC$

 $(v_{g1} - v_{g2}) \left(-12 \ \lambda^2 + 49 \ v_{g1}^2 - 98 \ v_{g1} \ v_{g2} + 49 \ v_{g2}^2 \right) + 2 \ C \ \omega \ \kappa_2 \left(v_{g1} - v_{g2} \right) \left(49 \ v_{p2} + 147 \ v_{p2} - 197 \ v_{p2} + 147 \ v_{p2} \right) + 9 \ C^4 \ \omega^4 \ \kappa_2^4 \left(v_{p1} - v_{g2} \right) + 2 \ C \ \omega^2 + 147 \ v_{g1}^2 - 294 \ v_{g1} \ v_{g2} + 147 \ v_{g2}^2 \right) + 9 \ C^4 \ \omega^4 \ \kappa_2^4 \left(v_{p1} - v_{g2} \right) \left(-12 \ \kappa_2^2 \ w_{p1} \ v_{p2} + 49 \ v_{q2}^2 + 49 \ v_{q2}^2 \right) + 9 \ C \ (-8 \ \kappa_2^2 \ + 147 \ v_{q1}^2 - 294 \ v_{g1} \ v_{g2} + 147 \ v_{q2}^2 \right) + 9 \ C^4 \ \omega^4 \ \kappa_2^4 \left(v_{p1} - v_{q2} \right) \left(-12 \ \kappa_2^2 \ w_{p1} \ v_{p2} + 149 \ v_{q2}^2 + 147 \ v_{q1}^2 - 294 \ v_{g1} \ v_{g2} + 147 \ v_{q2}^2 \right) + 9 \ C^4 \ \omega^4 \ \kappa_2^4 \left(v_{p1} - v_{q2} \right) \left(-12 \ \kappa_2^2 \ w_{p1} \ v_{p2} + 147 \ v_{q1}^2 - 294 \ v_{g1} \ v_{g2} + 147 \ v_{q2}^2 \right) + 9 \ C^4 \ \omega^4 \ \kappa_2^4 \ (v_{p1} - v_{q2}) \right)$

 $\left(12 \, v_{bc}^{5} + 48 \, v_{bc}^{4} \left(v_{g1} - v_{g2}\right) - 12 \, v_{bc}^{2} \left(\lambda^{2} - 6 \, v_{g1}^{2} + 12 \, v_{g1}^{2} v_{g2} - 6 \, v_{g2}^{2}\right) + 2 \, \lambda^{2} \left(v_{g1} - v_{g2}\right) \left(\lambda^{2} - 2 \, v_{g1}^{2} + 4 \, v_{g1} \, v_{g2} - 2 \, v_{g1}^{2}\right) + 4 \, v_{bc}^{2} \left(v_{g1} - v_{g2}\right) \left(-7 \, \lambda^{2} + 12 \, v_{g1}^{2} - 24 \, v_{g1} \, v_{g2} + 12 \, v_{g2}^{2}\right) + 0 \, v_{bc}^{2} \left(3 \, \lambda^{4} + 12 \, v_{g1}^{4} - 4 \, v_{g1}^{2} - 20 \, \lambda^{2} \, v_{g2}^{2}\right) + 2 \, v_{g1}^{2} \left(-20 \, \lambda^{2} + 72 \, v_{g2}^{2}\right) + 8 \, v_{g1} \left(5 \, \lambda^{2} \, v_{g2} - 6 \, v_{g3}^{2}\right)\right) \right) + c^{2} \, \omega^{2} \, \kappa_{1}^{2} \left(2 \, \left(2 \, \lambda^{2} + 7 \, v_{bc}^{2}\right) \left(v_{g1} - v_{g2}\right)^{4} + \frac{12 \, v_{g1}^{2} - 20 \, \lambda^{2} \, v_{g2}^{2} + 12 \, v_{g1}^{2} + 22 \, v_{g2}^{2}\right) + 8 \, v_{g1} \left(5 \, \lambda^{2} \, v_{g2} - 6 \, v_{g3}^{2}\right) \right) \right) + c^{2} \, \omega^{2} \, \kappa_{1}^{2} \left(2 \, \left(2 \, \lambda^{2} + 7 \, v_{bc}^{2}\right) \left(v_{g1} - v_{g2}\right)^{4} + \frac{12 \, v_{g1}^{2} - 20 \, \lambda^{2} \, v_{g1}^{2} + 22 \, v_{g1}^{2} + 22 \, v_{g2}^{2}\right) + 8 \, v_{g1} \left(5 \, \lambda^{2} \, v_{g2} - 6 \, v_{g3}^{2}\right) \right) \right) + c^{2} \, \omega^{2} \, \kappa_{1}^{2} \left(2 \, \left(2 \, \lambda^{2} + 7 \, v_{bc}^{2}\right) \left(v_{g1} - v_{g2}\right)^{4} + \frac{12 \, v_{g1}^{2} - 20 \, \lambda^{2} \, v_{g1}^{2} + 22 \, v_{g1}^{2} + 22 \, v_{g2}^{2}\right) + 8 \, v_{g1} \left(5 \, \lambda^{2} \, v_{g2} - 6 \, v_{g3}^{2}\right) \right) \right) + c^{2} \, \omega^{2} \, \kappa_{1}^{2} \left(2 \, \left(2 \, \lambda^{2} + 7 \, v_{bc}^{2}\right) \left(v_{g1} - v_{g2}\right)^{4} + \frac{12 \, v_{g1}^{2} - 20 \, \lambda^{2} \, v_{g1}^{2} + 22 \, v_{g1}^{2} + 22 \, v_{g1}^{2} + 22 \, v_{g1}^{2}\right) + \frac{12 \, v_{g1}^{2} + 22 \,$

 $2 C^{2} \omega^{2} R_{2}^{2} (v_{g1} - v_{g2})^{2} \left(147 v_{DC}^{4} - 24 \lambda^{2} v_{DC} (v_{g1} - v_{g2}) + 294 v_{DC}^{3} (v_{g1} - v_{g2}) - 3 v_{DC}^{2} (8 \lambda^{2} - 49 v_{g1}^{2} + 98 v_{g1} v_{g2} - 49 v_{g2}^{2}) + 4 \lambda^{2} \left(3 \lambda^{2} - v_{g1}^{2} + 2 v_{g1} v_{g2} - v_{g2}^{2}\right) + 9 C^{4} \omega^{4}$

 $R_{2}^{4} \left(60 V_{DC}^{6} + 240 V_{DC}^{5} (V_{g1} - V_{g2}) + 4 \lambda^{2} V_{DC} (V_{g1} - V_{g2}) (5 \lambda^{2} - 12 V_{g1}^{2} + 24 V_{g1} V_{g2} - 12 V_{g2}^{2}) - 60 V_{DC}^{4} (\lambda^{2} - 6 V_{g1}^{2} + 12 V_{g1} V_{g2} - 6 V_{g2}^{2}) + 2 \lambda^{2} (V_{g1} - V_{g2})^{2} (3 \lambda^{2} - 2 V_{g1}^{2} + 4 V_{g1} V_{g2} - 2 V_{g2}^{2}) + 80 V_{3C}^{3} (V_{g1} - V_{g2}) (-2 \lambda^{2} + 3 V_{g1}^{2} - 6 V_{g1} + 3 V_{g2}^{2}) + 3 V_{DC}^{2} (5 \lambda^{4} + 20 V_{g1}^{4} - 80 V_{g1}^{3} V_{g2} - 48 \lambda^{2} V_{g2}^{2} - 24 V_{g1}^{2} (2 \lambda^{2} - 5 V_{g2}^{2}) + 16 V_{g1} (6 \lambda^{2} V_{g2} - 5 V_{g2}^{3})))) \right)$

• β₃

- $\left(3 \lambda^{3} C^{3} \omega^{3} (R_{1} R_{2})^{2} (R_{1} V_{DC} R_{2} (V_{DC} + V_{g1} V_{g2}) (V_{g1} V_{g2}) (C^{2} \omega^{2} R_{1}^{2} (\lambda^{2} 2 V_{DC}^{2}) 2 C^{2} \omega^{2} R_{1} R_{2} (\lambda^{2} 2 V_{DC}^{2} 2 V_{DC} (V_{g1} V_{g2})) + 2 (V_{g1} V_{g2})^{2} + C^{2} (C^{2} 2 V_{DC}^{2} (V_{g1} V_{g2}) + 2 (V_{g1} V_{g2})) + 2 (V_{g1} V_{g2})^{2} + C^{2} (C^{2} 2 V_{DC}^{2} (V_{g1} V_{g2}) + 2 (V_{g1} V_{g2})) + 2 (V_{g1} V_{g2})^{2} + C^{2} (C^{2} 2 V_{DC}^{2} (V_{g1} V_{g2}) + 2 (V_{g1} V_{g2})) + 2 (V_{g1} V_{g2})^{2} + C^{2} (C^{2} 2 V_{DC}^{2} (V_{g1} V_{g2}) + 2 (V_{g1} V_{g2}) + 2 (V_{g1} V_{g2}) + 2 (V_{g1} V_{g2})^{2} + C^{2} (V_{g1} V_{g2$
- $C^{2} \omega^{2} R_{2}^{2} \left(\lambda^{2} 2 V_{DC}^{2} 2 V_{g1}^{2} 4 V_{DC} (V_{g1} V_{g2}) + 4 V_{g1} V_{g2} 2 V_{g2}^{2} \right) \right) \Big/$
- $\left(2 \left(9 \ \text{C}^6 \ \text{w}^6 \ \text{R}_1^6 \ \text{V}_{\text{DC}}^2 \left(\text{A}^2 2 \ \text{V}_{\text{DC}}^2 \right)^2 18 \ \text{C}^6 \ \text{w}^6 \ \text{R}_1^5 \ \text{R}_2 \ \text{V}_{\text{DC}} \left(\text{A}^2 2 \ \text{V}_{\text{DC}}^2 \right) \right) \\ \left(3 \ \text{A}^2 \ \text{V}_{\text{DC}} 6 \ \text{V}_{\text{DC}}^3 + \text{A}^2 \ \left(\text{V}_{\text{gl}} \text{V}_{\text{g2}} \right) 6 \ \text{V}_{\text{DC}}^2 \left(\text{V}_{\text{gl}} \text{V}_{\text{g2}} \right) \right) \\ + \left(\text{V}_{\text{gl}} \text{V}_{\text{g2}} \right)^6 + \left(\text{V}_{\text{gl}} \text{V}_{\text{g2}} \right)^2 + \left(\text{V}_{\text{g2}} \text{V}_{g$
 - $9 \ \text{C}^6 \ \omega^6 \ \text{R}_2^6 \ \left(\text{V}_{\text{DC}} + \text{V}_{\text{gl}} \text{V}_{\text{g2}} \right)^2 \ \left(\text{A}^2 2 \ \text{V}_{\text{DC}}^2 2 \ \text{V}_{\text{g1}}^2 4 \ \text{V}_{\text{DC}} \ \left(\text{V}_{\text{g1}} \text{V}_{\text{g2}} \right) + 4 \ \text{V}_{\text{g1}} \ \text{V}_{\text{g2}} 2 \ \text{V}_{\text{g2}}^2 \right)^2 + 2 \ \text{V}_{\text{g2}}^2 + 2 \ \text{V$
 - $2 \ C^2 \ \omega^2 \ R_2^2 \ (V_{g1} V_{g2})^{\ 4} \ \left(2 \ \mathbb{A}^2 \ + \ 7 \ V_{DC}^2 \ + \ 7 \ V_{g1}^2 \ + \ 14 \ V_{DC} \ (V_{g1} V_{g2}) \ \ 14 \ V_{g1} \ V_{g2} \ + \ 7 \ V_{g2}^2 \right) \ + \ C^2 \ (V_{g1} V_{g2})^{\ 4} \ \left(2 \ \mathbb{A}^2 \ + \ 7 \ V_{DC}^2 \ + \ 7 \ V_{g1}^2 \ + \ 14 \ V_{DC} \ (V_{g1} V_{g2}) \ \ 14 \ V_{g1} \ V_{g2} \ + \ 7 \ V_{g2}^2 \right) \ + \ C^2 \ (V_{g1} V_{g2})^{\ 4} \ (V$
 - $c^{4} \omega^{4} \kappa_{2}^{6} (v_{g1} v_{g2})^{2} (4 \lambda^{4} + 49 v_{Dc}^{4} + 49 v_{g1}^{4} + 19 v_{Dc}^{3} (v_{g1} v_{g2}) 19 \varepsilon v_{g1}^{3} v_{g2} 8 \lambda^{2} v_{g2}^{2} + 49 v_{g2}^{4} + 4 v_{Dc} (v_{g1} v_{g2}) (-4 \lambda^{2} + 49 v_{g1}^{2} 98 v_{g1} v_{g2} + 49 v_{g2}^{2}) + 2 \varepsilon v_{g1}^{2} + 4 v_{g2}^{2} + 4 v_{g1}^{2} + 4 v_{g2}^{2} + 4 v_{g2}^{2}$
 - $v_{g1}^{2} \left(-8 \, x^{2} + 294 \, v_{g2}^{2}\right) + v_{DC}^{2} \left(-8 \, x^{2} + 294 \, v_{g1}^{2} 588 \, v_{g1} \, v_{g2} + 294 \, v_{g2}^{2}\right) + 4 \, v_{g1} \left(4 \, x^{2} \, v_{g2} 49 \, v_{g2}^{2}\right) + 2 \, 4 \, \omega^{4} \, u^{4} \, R_{1}^{4} \left(\left(4 \, x^{4} 8 \, x^{2} \, v_{DC}^{2} + 49 \, v_{g1}^{4}\right) + 2 \, 94 \, v_{g2}^{2}\right) + 2 \, 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, 4 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, v_{g1}^{2} \left(-8 \, x^{2} \, v_{DC}^{2}\right) + 2 \, v_{DC}^{2} \left(-8 \,$
 - $\left(60 \, v_{bc}^{c} + 10 \, a^{4} \, v_{Dc}^{c} \, (v_{g1} v_{g2}) 80 \, a^{2} \, v_{Dc}^{c} \, (v_{g1} v_{g2}) + 120 \, v_{bc}^{c} \, (v_{g1} v_{g2}) + a^{4} \, (v_{g1} v_{g2}) + a^{4} \, v_{Dc}^{c} \, (z^{2} 8 \, v_{g1}^{2} + 16 \, v_{g1} \, v_{g2} 8 \, v_{g2}^{2}) 60 \, v_{bc}^{b} \, (a^{2} v_{g1}^{c} + 2 \, v_{g1} \, v_{g2} v_{g2}^{2})) \right) 4 \, c^{4} \, u^{4} \, r_{1}^{3} \, R_{2} \, \left((v_{g1} v_{g2})^{2} \, (4 \, a^{4} 8 \, a^{2} \, v_{bc}^{2} + 49 \, v_{bc}^{2} + 49 \, v_{bc}^{2} \, (v_{g1} v_{g2}) + 4 \, a^{2} \, v_{bc} \, (-v_{g1} + v_{g2}) \right) + 9 \, c^{2} \, u^{2} \, R_{2}^{2} \, (20 \, v_{bc}^{5} + 60 \, v_{bc}^{5} \, (v_{g1} v_{g2})^{2} + a^{2} \, v_{bc}^{2} \, (5 \, a^{2} 24 \, v_{g1}^{2} + 24 \, v_{g1}$
 - $48 v_{g1} v_{g2} 24 v_{g2}^2 + \lambda^2 v_{DC} (v_{g1} v_{g2}) (5 \lambda^2 4 v_{g1}^2 + 8 v_{g1} v_{g2} 4 v_{g2}^2) 20 v_{DC}^4 (\lambda^2 3 v_{g1}^2 + 6 v_{g1} v_{g2} 3 v_{g2}^2) + 20 v_{DC}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 2 v_{g1} v_{g2} + v_{g2}^2))) 2 v_{DC}^2 (\lambda^2 3 v_{g1}^2 + 6 v_{g1} v_{g2} 3 v_{g1}^2) + 20 v_{DC}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 2 v_{g1} v_{g2} + v_{g2}^2))) 2 v_{DC}^2 (\lambda^2 3 v_{g1}^2 + 6 v_{g1} v_{g2} 3 v_{g1}^2) + 20 v_{DC}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 2 v_{g1} v_{g2} + v_{g2}^2))) 2 v_{DC}^2 (\lambda^2 3 v_{g1}^2 + 6 v_{g1} v_{g2} 3 v_{g1}^2) + 20 v_{DC}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2))) 2 v_{DC}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2)) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2)) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g2}^2)) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2)) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2)) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g2}) (-2 \lambda^2 + v_{g1}^2 + v_{g1}^2)) + 2 v_{g1}^2 (v_{g1} v_{g1} + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g1} + v_{g1} + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g1} + v_{g1}^2) + 2 v_{g1}^2 (v_{g1} v_{g1} + v_{g1}$

 $2 \ C^{2} \ \omega^{2} \ R_{1} \ R_{2} \ \left(2 \ \left(2 \ \lambda^{2} + 7 \ v_{DC}^{2} + 7 \ v_{DC} \ (v_{g1} - v_{g2}) \right) \ (v_{g1} - v_{g2})^{4} + 2 \ C^{2} \ \omega^{2} \ R_{2}^{2} \ (v_{g1} - v_{g2})^{2} \ \left(49 \ v_{DC}^{4} + 147 \ v_{DC}^{2} \ (v_{g1} - v_{g2}) + 4 \ \lambda^{2} \ \left(\lambda^{2} - v_{g1}^{2} + 2 \ v_{g1} \ v_{g2} - v_{g2}^{2}\right) + v_{DC} \ (v_{g1} - v_{g2}) \ (-12 \ \lambda^{2} + 49 \ v_{g1}^{2} - 98 \ v_{g1} \ v_{g2}^{2} + 49 \ v_{g2}^{2}) + v_{DC}^{2} \ \left(-8 \ \lambda^{2} + 147 \ v_{g1}^{2} - 294 \ v_{g1} \ v_{g2} + 147 \ v_{g2}^{2}\right) + 9 \ C^{4} \ \omega^{4} \ R_{2}^{4} \ (v_{DC} + v_{g1} - v_{g2}) \ (-12 \ \lambda^{2} + 49 \ v_{g1}^{2} - 294 \ v_{g1} \ v_{g2} + 147 \ v_{g2}^{2}) + 9 \ C^{4} \ \omega^{4} \ R_{2}^{4} \ (v_{DC} + v_{g1} - v_{g2}) \ (-12 \ \lambda^{2} + 49 \ v_{g1}^{2} - 294 \ v_{g1} \ v_{g2} + 147 \ v_{g2}^{2}) + 9 \ C^{4} \ \omega^{4} \ R_{2}^{4} \ (v_{DC} + v_{g1} - v_{g2}) \ (-12 \ \lambda^{2} + 49 \ v_{g2}^{2}) + 9 \ C^{4} \ \omega^{4} \ R_{2}^{4} \ (v_{DC} + v_{g1} - v_{g2}) \ (-12 \ \lambda^{2} + 49 \ v_{g2}^{2}) \ (-12 \ v_{g2}^{2}) \ (-12 \ v_{g2}^{2}) \ (-12 \ v_{g2}^{2} + 49 \ v_{g2}^{2}) \ (-12 \ v_{g2}^{2} + v_{g2}^{2} + v_{g2}^{2$

- $\left(12 v_{DC}^{5} + 48 v_{DC}^{4} (v_{g1} v_{g2}) 12 v_{DC}^{3} \left(\lambda^{2} 6 v_{g1}^{2} + 12 v_{g1} + v_{g2} 6 v_{g2}^{2}\right) + 2 \lambda^{2} (v_{g1} v_{g2}) \left(\lambda^{2} 2 v_{g1}^{2} + 4 v_{g1} v_{g2} 2 v_{g2}^{2}\right) + 4 v_{DC}^{2} (v_{g1} v_{g2}) \left(-7 \lambda^{2} + 12 v_{g1}^{2} 24 v_{g1} v_{g2} + 12 v_{g2}^{2}\right) + v_{DC} (3 \lambda^{4} + 12 v_{g1}^{4} 48 v_{g1}^{3} v_{g2} 20 \lambda^{2} v_{g2}^{2} + 12 v_{g1}^{4} + v_{g1}^{2} (-20 \lambda^{2} + 72 v_{g2}^{2}) + 8 v_{g1} (5 \lambda^{2} v_{g2} 6 v_{g2}^{3}))\right) + c^{2} \omega^{2} \kappa_{1}^{2} \left(2 (2 \lambda^{2} + 7 v_{DC}^{2}) (v_{g1} v_{g2})^{4} + v_{DC} (v_{g1}$
- $2\ c^{2}\ \omega^{2}\ R_{2}^{2}\ (V_{g1}-V_{g2})^{2}\ (147\ V_{DC}^{4}-24\ A^{2}\ V_{DC}\ (V_{g1}-V_{g2})+294\ V_{DC}^{3}\ (V_{g1}-V_{g2})-3\ V_{DC}^{2}\ (8\ A^{2}-49\ V_{g1}^{2}+98\ V_{g1}\ V_{g2}-49\ V_{g2}^{2})+4\ A^{2}\ (3\ A^{2}-V_{g1}^{2}+2\ V_{g1}\ V_{g2}-V_{g2}^{2}))+9\ C^{4}\ \omega^{4}$