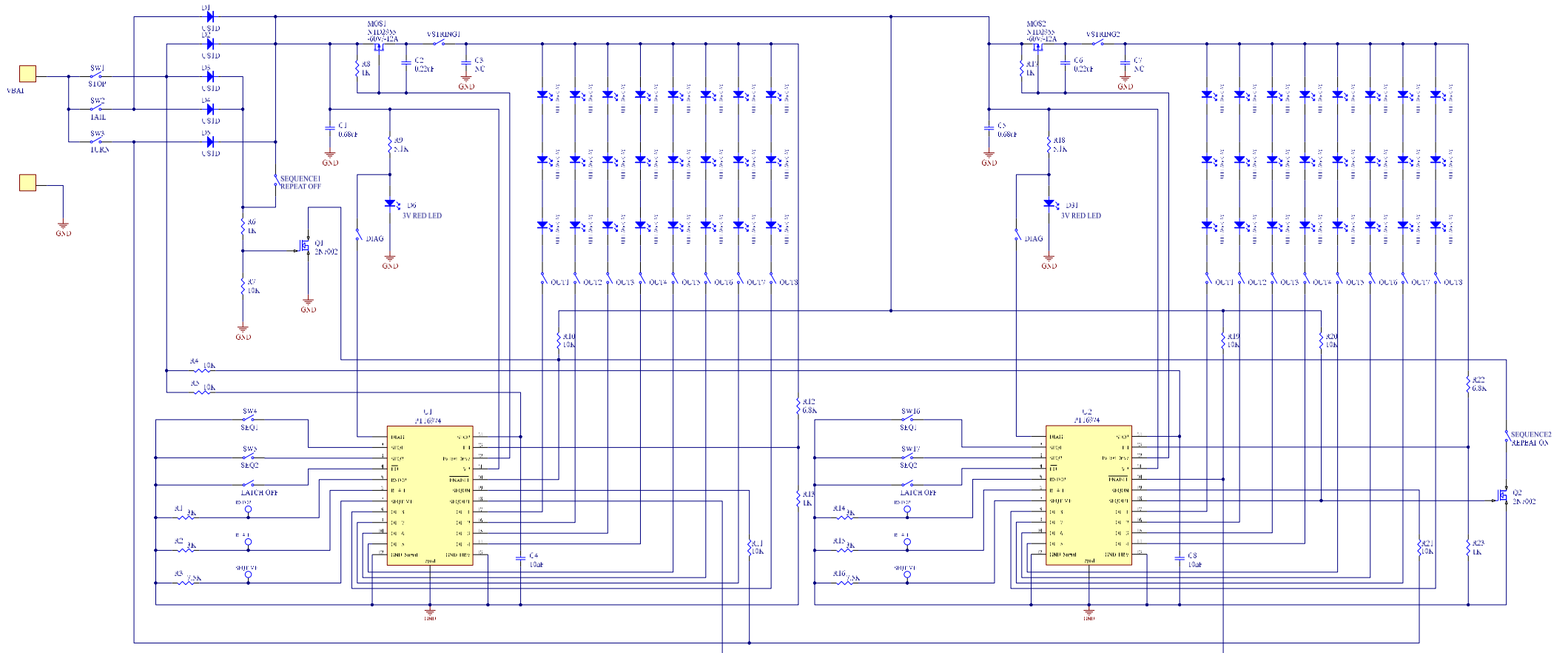




## PT16974 demo test report

| Parameter      | Specifications   |
|----------------|------------------|
| Operation Mode | STOP, TAIL, TURN |
| Input Voltage  | 9~22V            |
| LED Voltage    | 6V (3pcs LED)    |
| LED Current    | 50mA/CH          |

# 1 Schematic



## 2 BOM

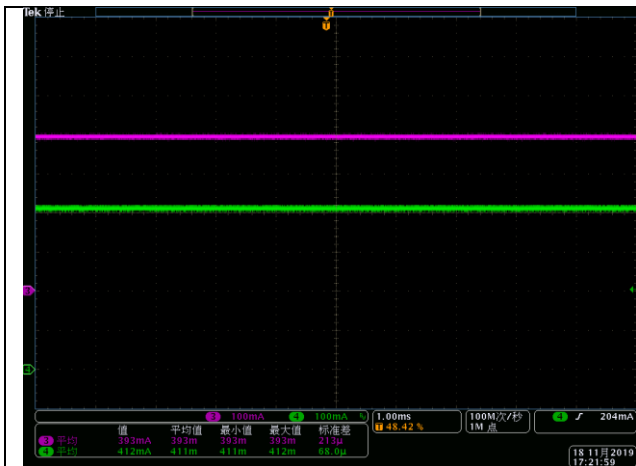
| Designator                          | Qty | Value   | Description  | Package   |
|-------------------------------------|-----|---------|--|-----------|
| U1, U2                              | 2   | PT16974 | Enhanced Linear Current Regulator and Controller for Automotive Sequenced LED Lighting | HSSOP24   |
| C1, C5                              | 2   | 0.68uF  | CAP, CERM,0.68uF, 50V, +/-10%, X7R   | 0805      |
| C2, C6                              | 2   | 0.22uF  | CAP, CERM,0.22uF, 50V, +/-10%, X7R   | 0805      |
| C3, C7                              | 2   | NC      |  | 0805      |
| C4, C8                              | 2   | 10nF    | CAP, CERM,10nF, 50V, +/-10%, X7R   | 0805      |
| D1, D2, D3, D4, D5                  | 5   | US1D    | Diode, Fast switching rectifier, 200V, 1A  | SMA       |
| D6, D31                             | 2   | RED LED | LED, 3V  | LED-0805R |
| MOS1, MOS2                          | 2   | NTD2955 | Power MOSFET -60 V, -12 A, P-Channel   | DPAK      |
| Q1, Q2                              | 2   | 2N7002  | MOSFET, N-Channel, 60V, 115mA  | SOT-23    |
| R1, R2, R14, R15                    | 4   | 3k      | RES, 3k, 1%, 0.125W  | 0805      |
| R3, R16,                            | 2   | 7.5k    | RES, 7.5k, 1%, 0.125W  | 0805      |
| R4, R5, R7, R10, R11, R19, R20, R21 | 8   | 10k     | RES, 10k, 1%, 0.125W   | 0805      |
| R6, R8, R13, R23,R17                | 5   | 1k      | RES, 1k, 1%, 0.125W  | 0805      |
| R9, R18                             | 2   | 5.1k    | RES, 5.1k, 1%, 0.125W  | 0805      |
| R12, R22                            | 2   | 6.8k    | RES, 6.8k, 1%, 0.125W  | 0805      |

### 3 Performance Data

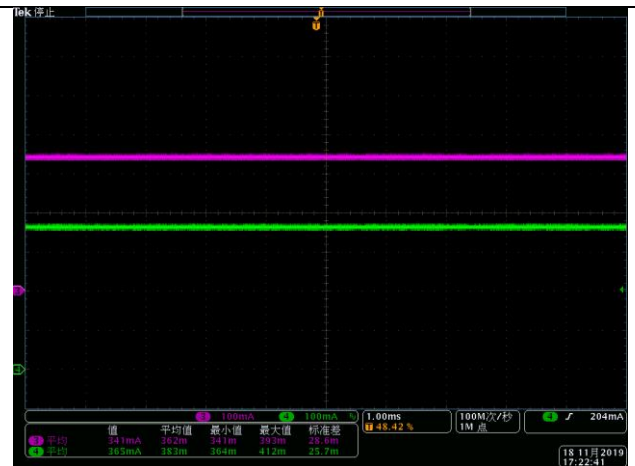
#### 3.1 STOP mode

| V <sub>IN</sub> ,[V]   | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| I <sub>IN</sub> ,[mA]  | 415   | 416   | 417   | 418   | 418   | 419   | 420   | 421   | 422   | 423   | 395   |
| I <sub>OUT</sub> ,[mA] | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 367   |
| OUT1,[mA]              | 49.68 | 49.69 | 49.69 | 49.7  | 49.71 | 49.71 | 49.71 | 49.72 | 49.72 | 49.73 | 46.24 |
| OUT2,[mA]              | 49.73 | 49.74 | 49.74 | 49.74 | 49.74 | 49.75 | 49.75 | 49.74 | 49.74 | 49.74 | 46.23 |
| OUT3,[mA]              | 50.58 | 50.58 | 50.58 | 50.58 | 50.59 | 50.59 | 50.59 | 50.59 | 50.59 | 50.6  | 47.06 |
| OUT4,[mA]              | 50.14 | 50.15 | 50.16 | 50.17 | 50.19 | 50.19 | 50.2  | 50.21 | 50.21 | 50.22 | 46.67 |
| OUT5,[mA]              | 50.47 | 50.47 | 50.48 | 50.49 | 50.5  | 50.48 | 50.48 | 50.5  | 50.5  | 50.51 | 47    |
| OUT6,[mA]              | 49.86 | 49.87 | 49.88 | 49.88 | 49.88 | 49.89 | 49.89 | 49.9  | 49.9  | 49.9  | 46.69 |
| OUT7,[mA]              | 49.85 | 49.86 | 49.86 | 49.86 | 49.9  | 49.9  | 49.9  | 49.9  | 49.91 | 49.91 | 46.72 |
| OUT8,[mA]              | 49.56 | 49.56 | 49.57 | 49.57 | 49.57 | 49.57 | 49.58 | 49.59 | 49.59 | 49.59 | 46.4  |
| V <sub>IN</sub> ,[V]   | 20    | 21    | 22    | 23    | 24    | 25    | 26    | 27    | 28    | 29    | 30    |
| I <sub>IN</sub> ,[mA]  | 366   | 337   | 308   | 293   | 295   | 296   | 297   | 298   | 299   | 299   | 300   |
| I <sub>OUT</sub> ,[mA] | 338   | 308   | 282   | 267   | 266   | 266   | 266   | 266   | 267   | 267   | 267   |
| OUT1,[mA]              | 42.56 | 38.9  | 35.24 | 33.36 | 33.41 | 33.42 | 33.43 | 33.43 | 33.44 | 33.45 | 33.45 |
| OUT2,[mA]              | 42.53 | 38.85 | 35.18 | 33.34 | 33.33 | 33.34 | 33.34 | 33.35 | 33.35 | 33.35 | 33.34 |
| OUT3,[mA]              | 43.34 | 39.62 | 35.94 | 34.08 | 34.09 | 34.1  | 34.1  | 34.1  | 34.1  | 34.1  | 34.1  |
| OUT4,[mA]              | 42.95 | 39.22 | 35.54 | 33.66 | 33.67 | 33.67 | 33.68 | 33.68 | 33.7  | 33.71 | 33.71 |
| OUT5,[mA]              | 43.27 | 39.56 | 35.88 | 33.99 | 33.99 | 34.01 | 34    | 34    | 34    | 34    | 34    |
| OUT6,[mA]              | 42.94 | 39.21 | 35.51 | 33.41 | 33.41 | 33.41 | 33.42 | 33.42 | 33.42 | 33.43 | 33.43 |
| OUT7,[mA]              | 43    | 39.29 | 35.62 | 33.55 | 33.55 | 33.56 | 33.56 | 33.55 | 33.55 | 33.56 | 33.55 |
| OUT8,[mA]              | 42.69 | 39.04 | 35.36 | 33.29 | 33.28 | 33.28 | 33.28 | 33.28 | 33.28 | 33.29 | 33.29 |

Note: LED current test is based on U1 OUT1~OUT8



STOP mode LED current, VIN=12V  
CH3-U1\_I<sub>LED</sub>, CH4-U2\_I<sub>LED</sub>



STOP mode LED current, VIN=20V  
CH3-U1\_I<sub>LED</sub>, CH4-U2\_I<sub>LED</sub>

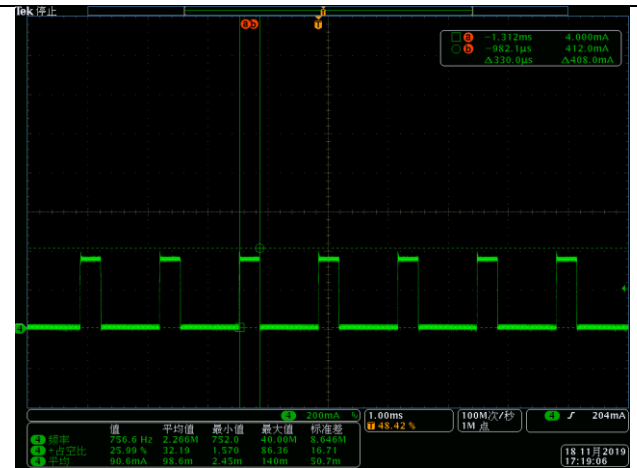
### 3.2 TAIL mode

| VIN,[V]                | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| I <sub>LED</sub> ,[mA] | 141   | 141   | 141   | 141   | 141   | 141   | 142   | 141   | 141   | 142   | 118   |
| Freq,[Hz]              | 756.4 | 758.3 | 759.1 | 759.6 | 759.8 | 760.1 | 760.4 | 760.8 | 761.3 | 755.2 | 751.5 |
| Duty cycle,[%]         | 34    | 33.99 | 33.99 | 33.99 | 33.99 | 33.99 | 33.99 | 33.99 | 33.99 | 33.67 | 30    |
| VIN,[V]                | 20    | 21    | 22    | 23    | 24    | 25    | 26    | 27    | 28    | 29    | 30    |
| I <sub>LED</sub> ,[mA] | 95.3  | 74.6  | 55.6  | 50.2  | 50.3  | 50.2  | 50.1  | 50.2  | 50.1  | 50.2  | 50.4  |
| Freq,[Hz]              | 751.6 | 751.8 | 752.4 | 760.5 | 760.8 | 760.5 | 761.3 | 761.4 | 761.7 | 761.7 | 761.8 |
| Duty cycle,[%]         | 25.98 | 22.03 | 17.73 | 16.53 | 16.52 | 16.51 | 16.51 | 16.52 | 16.53 | 16.52 | 16.55 |

Note: LED current test is based on U1 OUT1~OUT8



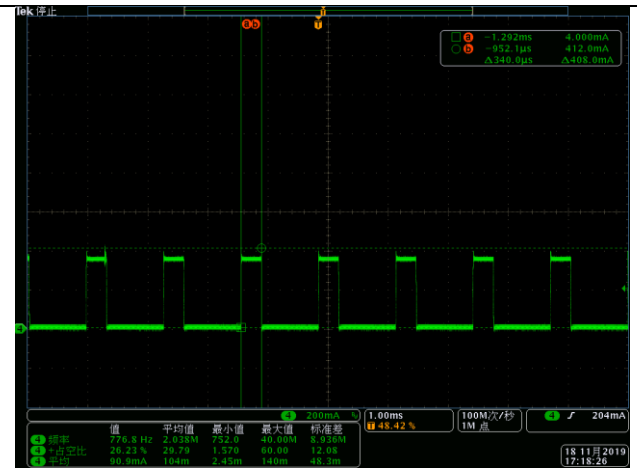
LED current of U1, VIN=12V



LED current of U1, VIN=20V



LED current of U2, VIN=12V



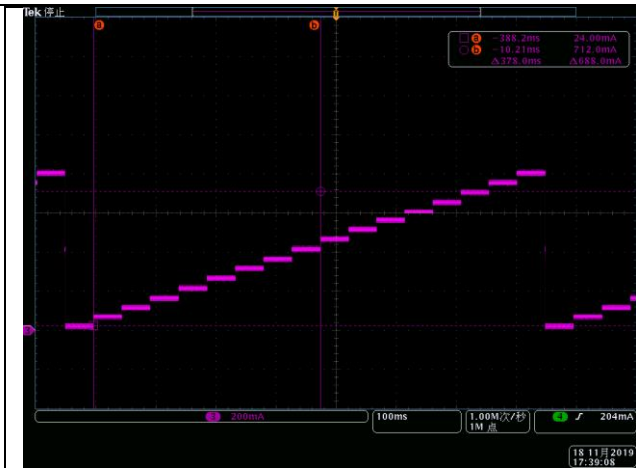
LED current of U2, VIN=20V

### 3.3 TURN mode

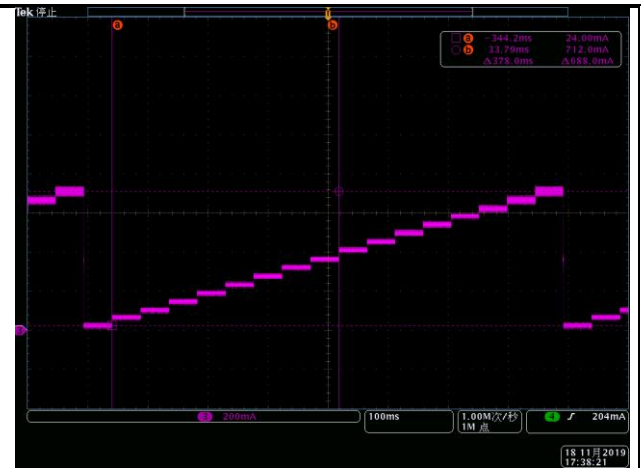
| VIN,[V]               | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| T <sub>U1</sub> ,[ms] | 379 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 377 | 377 | 378 |
| T <sub>U2</sub> ,[ms] | 374 | 375 | 374 | 374 | 374 | 374 | 374 | 374 | 375 | 374 | 374 |
| VIN,[V]               | 20  | 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| T <sub>U1</sub> ,[ms] | 377 | 377 | 377 | 377 | 377 | 377 | 377 | 378 | 377 | 377 | 377 |
| T <sub>U2</sub> ,[ms] | 374 | 374 | 374 | 374 | 374 | 374 | 375 | 374 | 375 | 374 | 374 |

Note: T<sub>U1</sub> is sequence time of U1, T<sub>U2</sub> is sequence time of U2

Sequence Time = 50 \* 7.5 (K) = 375msec



LED current waveform of TURN mode  
CH3-I\_IN, VIN=12V

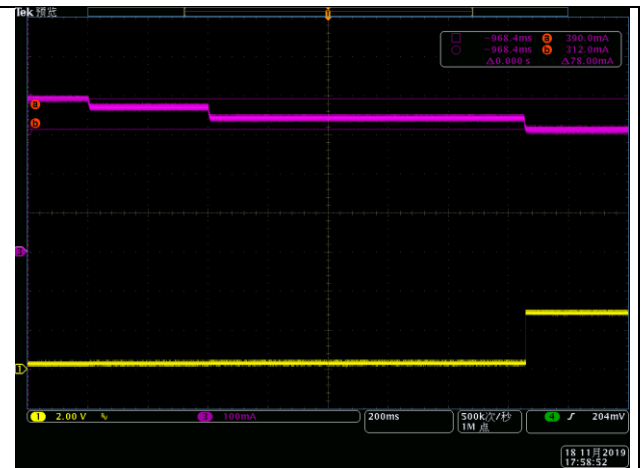


LED current waveform of TURN mode  
CH3-I\_IN, VIN=20V

### 3.4 DIAG Output

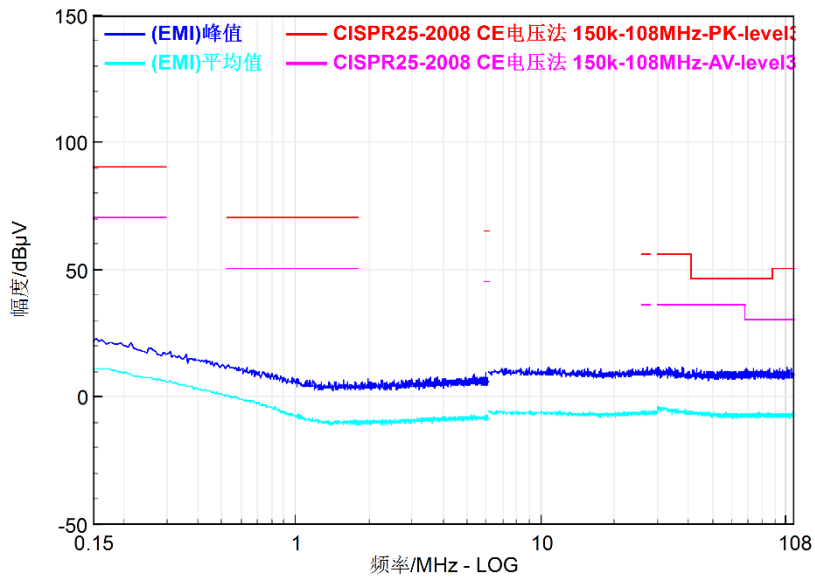


Open circuit failure  
OUT1 OPEN, LATCHOFF DISABLE  
CH1=DIAG, CH3-I\_LED, CH4-I\_OUT1

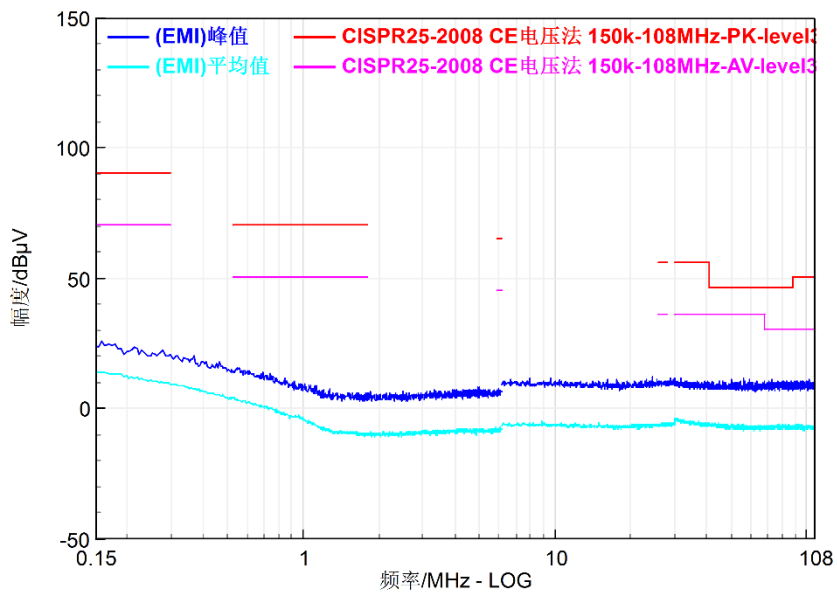


LED current derate  
IOUT=80% I<sub>RATE</sub>, LATCHOFF DISABLE  
CH1=DIAG, CH3-I\_LED

## 4 Conducted Emission



Conducted Emission Based on CISPR25 Class 3 Limits\_VIN



Conducted Emission Based on CISPR25 Class 3 Limits\_GND