

Features

- Input Voltage Range : 1.4V to 5.5V
- 15 μ A Ground Current (I_Q) at no Load
- PSRR = 70dB at 1kHz
- 1.5% Output Accuracy
- Low (0.1 μ A) Shutdown Current
- Dropout Voltage : 0.15V at 300mA when $V_{OUT} \geq 3V$
- Support Fixed Output Voltage 0.8V, 1.0V, 1.05V, 1.1V, 1.2V, 1.25V, 1.3V, 1.5V, 1.8V, 1.85V, 2V, 2.5V, 2.8V, 2.85V, 3V, 3.1V, 3.3V, 3.45V
- Current Limit Protection
- Over Temperature Protection
- Output Active Discharge Function
- DFN-4L 1x1 Packages

Applications

- CDM/GSM mobile phone
- PDAs /MP3
- Audio/Video equipment

General Description

The TPAP7343 is a low-dropout (LDO) voltage regulator with enable function that operates from a 1.4V to 5.5V supply. It provides up to 300mA of output current in miniaturized packaging.

The feature of 15 μ A low quiescent current and 0.5 μ A shutdown current are ideal for the battery application with long service life. The other features include current limit function, over temperature protection and output discharge function.

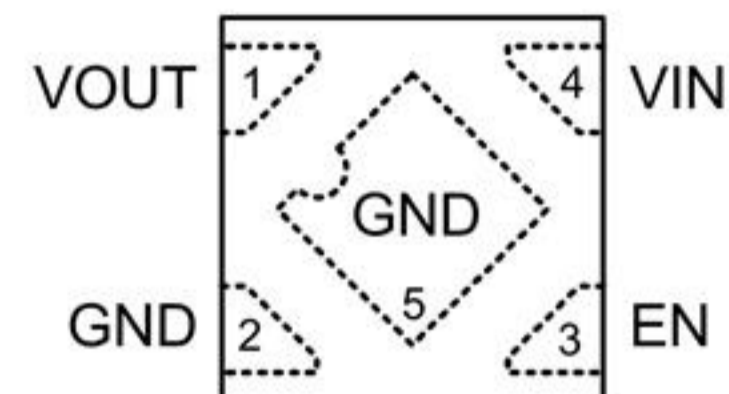
Ordering Information

TPAP7343D-33FS4

Output Voltage:33= 3.3V
18=1.8V
xx.xV

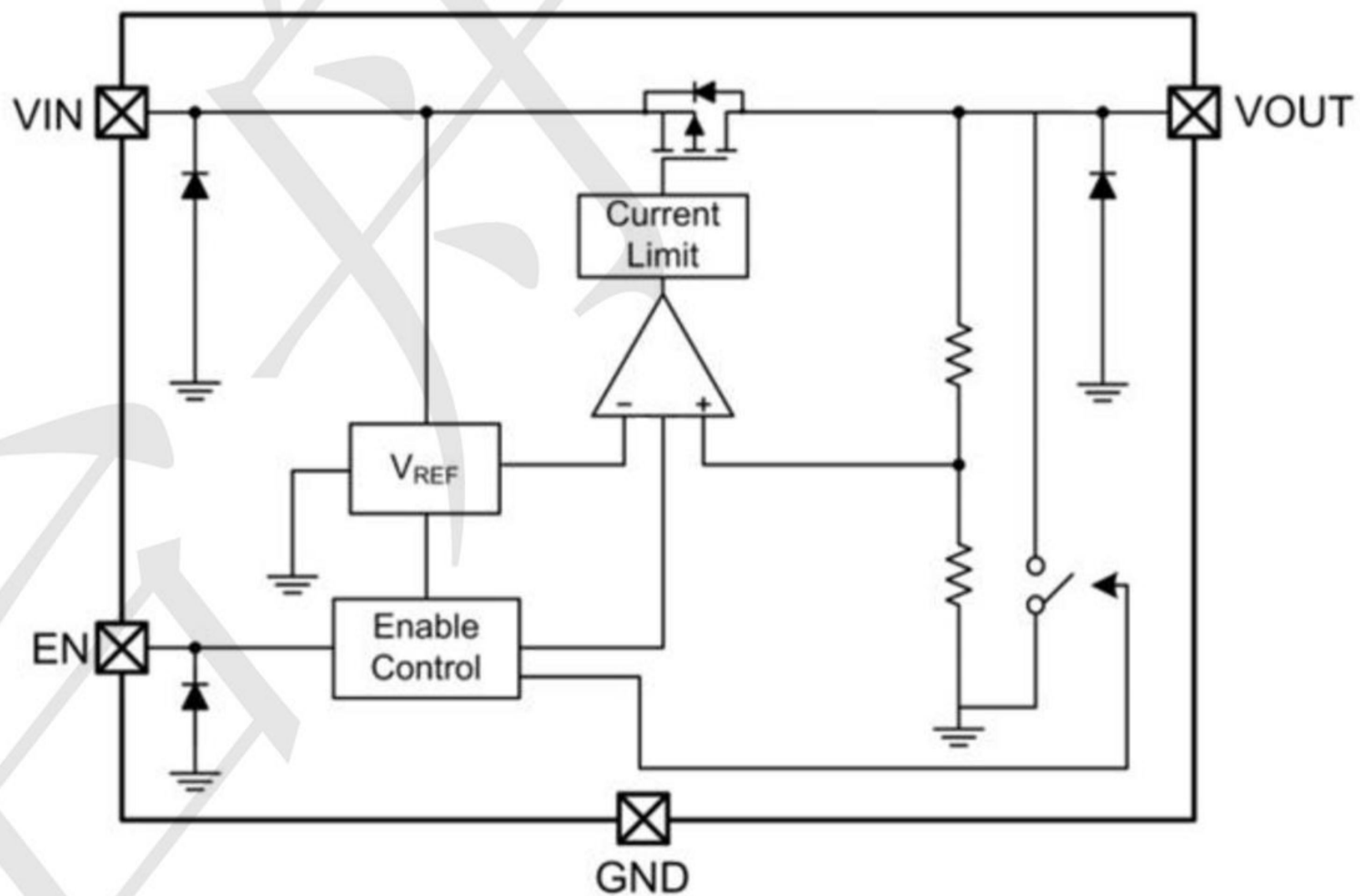
TPAP7343= TECH PUBLIC LDO Series

Pin Configuration



| PIN | Symbol | Description |
|-----|--------|------------------------------------|
| 1 | VOUT | Output |
| 2 | GND | Ground |
| 3 | EN | Enable (Active high, not floating) |
| 4 | VIN | Input |

BLOCK DIAGRAM



Absolute Maximum Rating ($T_A=25^\circ\text{C}$ unless otherwise noted)

- VIN, VOUT, EN to GND ----- -0.3V to 6.5V
- VOUT to VIN ----- -6.5V to 0.3V
- DFN-4L 1x1 ----- 0.44W
- Package Thermal Resistance (Note 2)
- DFN-4L 1x1 θ_{JA} ----- 226°C/W
- DFN-4L 1x1 θ_{JC} ----- 43°C/W
- Lead Temperature (Soldering, 10 sec.) ----- 260°C
- Junction Temperature ----- 150°C
- Storage Temperature Range ----- -65°C to 150°C
- ESD Susceptibility (Note 3)
- HBM (Human Body Model) ----- 2kV

Recommended Operating Conditions (Note 4)

- Input Voltage, VIN ----- 1.4V to 5.5V
- Junction Temperature Range ----- -40°C to 125°C

Electrical Characteristics ($T = 25^\circ\text{C}$ unless otherwise noted)

($V_{OUT} + 1 < V_{IN} < 5.5\text{V}$, $T_A = 25^\circ\text{C}$, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|------------|--|-----|------|------|---------------|
| Fixed Output Voltage Range | V_{OUT} | | 0.8 | -- | 3.45 | V |
| DC Output Accuracy | | $I_{LOAD} = 1\text{mA}$ | -2 | -- | 2 | % |
| Dropout Voltage ($I_{LOAD} = 300\text{mA}$) (Note 5) | V_{DROP} | $0.8\text{V} \leq V_{OUT} < 1.05\text{V}$ | -- | 0.7 | 0.97 | V |
| | | $1.05\text{V} \leq V_{OUT} < 1.2\text{V}$ | -- | 0.5 | 0.92 | |
| | | $1.2\text{V} \leq V_{OUT} < 1.5\text{V}$ | -- | 0.4 | 0.57 | |
| | | $1.5\text{V} \leq V_{OUT} < 1.8\text{V}$ | -- | 0.3 | 0.47 | |
| | | $1.8\text{V} \leq V_{OUT} < 2.1\text{V}$ | -- | 0.24 | 0.33 | |
| | | $2.1\text{V} \leq V_{OUT} < 2.5\text{V}$ | -- | 0.21 | 0.3 | |
| | | $2.5\text{V} \leq V_{OUT} < 2.8\text{V}$ | -- | 0.18 | 0.25 | |
| | | $2.8\text{V} \leq V_{OUT} < 3\text{V}$ | -- | 0.16 | 0.23 | |
| Dropout Voltage ($I_{LOAD} = 200\text{mA}$) (Note 6) | V_{DROP} | $1.8\text{V} \leq V_{OUT} < 2.1\text{V}$ | -- | 0.16 | 0.2 | V |
| V_{CC} Consumption Current | I_Q | $I_{LOAD} = 0\text{mA}$, $V_{OUT} \leq 5.5\text{V}$ $V_{IN} \geq V_{OUT} + V_{DROP}$ | -- | 15 | 18 | μA |

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit | |
|--------------------------------------|-----------------|--|------------------------------|-----|------|-------------|---------------|
| Shutdown GND Current (Note 7) | | $V_{EN} = 0V$ | -- | 0.1 | 0.5 | μA | |
| Shutdown Leakage Current (Note 7) | | $V_{EN} = 0V, V_{OUT} = 0V$ | -- | 0.1 | 0.5 | μA | |
| EN Input Current | I_{EN} | $V_{EN} = 5.5V$ | -- | -- | 0.1 | μA | |
| Line Regulation | $\Delta LINE$ | $I_{LOAD} = 1mA$ | $1.2V \leq V_{IN} < 1.5V$ | -- | 0.3 | 0.6 | % |
| | | | $1.5V \leq V_{IN} < 1.8V$ | -- | 0.15 | 0.3 | |
| | | | $1.8V \leq V_{IN} \leq 5.5V$ | -- | 0.13 | 0.35 | |
| Load Regulation | $\Delta LOAD$ | $1mA < I_{LOAD} < 300mA$ | -- | 0.5 | 1 | % | |
| Power Supply Rejection Ratio | PSRR | $V_{IN} = 3V, I_{LOAD} = 50mA,$ $C_{OUT} = 1\mu F, V_{OUT} = 2.5V, f = 1kHz$ | -- | 70 | -- | dB | |
| Output Voltage Noise | | $C_{OUT} = 1\mu F,$ $I_{LOAD} = 150mA,$ $BW = 10Hz$ to $100kHz,$ $V_{IN} = V_{OUT} + 1V$ | $V_{OUT} = 0.8V$ | -- | 38 | -- | μV_{RMS} |
| | | | $V_{OUT} = 1.2V$ | -- | 46 | -- | |
| | | | $V_{OUT} = 1.8V$ | -- | 48 | -- | |
| | | | $V_{OUT} = 3.3V$ | -- | 51 | -- | |
| Output Current Limit | I_{LIM} | $V_{OUT} = 90\%$ of $V_{OUT(NOM)}$ | 300 | 600 | -- | mA | |
| Enable Threshold Voltage | H-Level | V_{ENH} | $V_{IN} = 5V$ | 0.5 | 0.7 | 0.9 | V |
| | L-Level | V_{ENL} | $V_{IN} = 5V$ | 0.4 | 0.65 | 0.85 | |
| Thermal Shutdown Temperature | T_{SD} | $I_{LOAD} = 30mA, V_{IN} \geq 1.5V$ | -- | 150 | -- | $^{\circ}C$ | |
| Thermal Shutdown Hysteresis | ΔT_{SD} | | -- | 20 | -- | $^{\circ}C$ | |
| Discharge Resistance | | $EN = 0V, V_{OUT} = 0.1V$ | -- | 80 | -- | Ω | |

TYPICAL APPLICATION

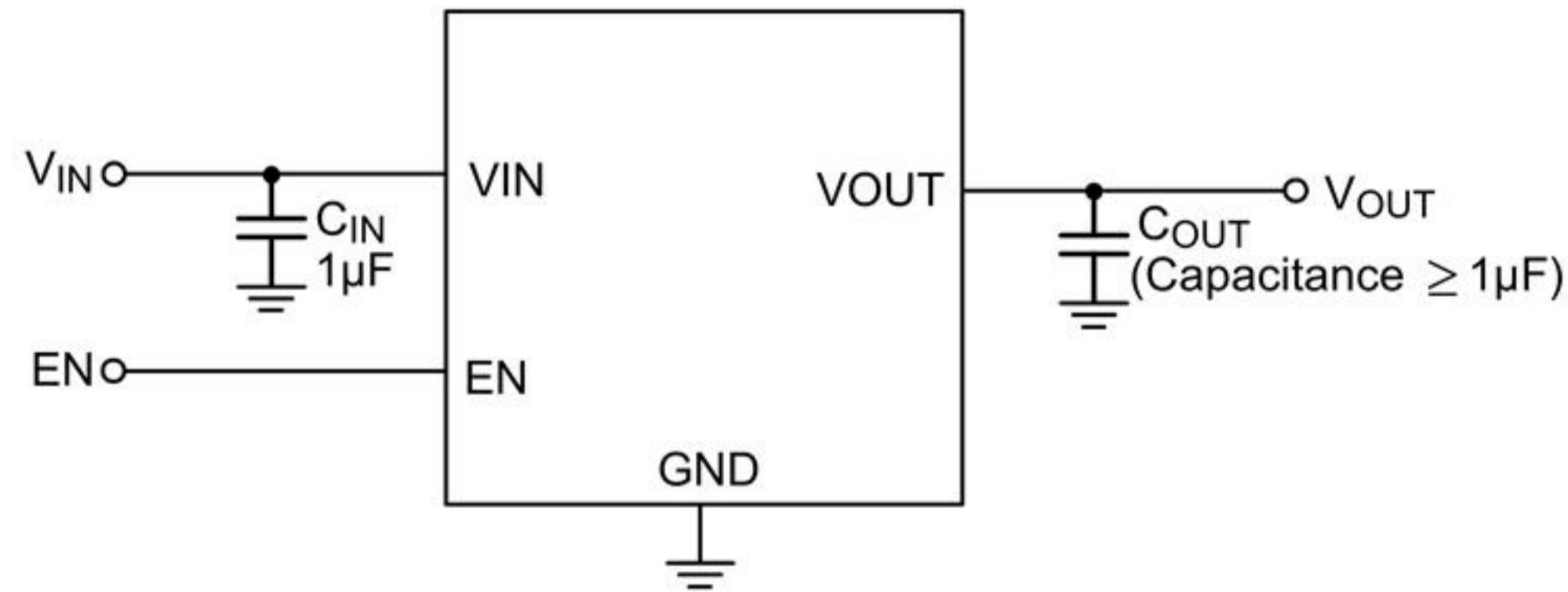
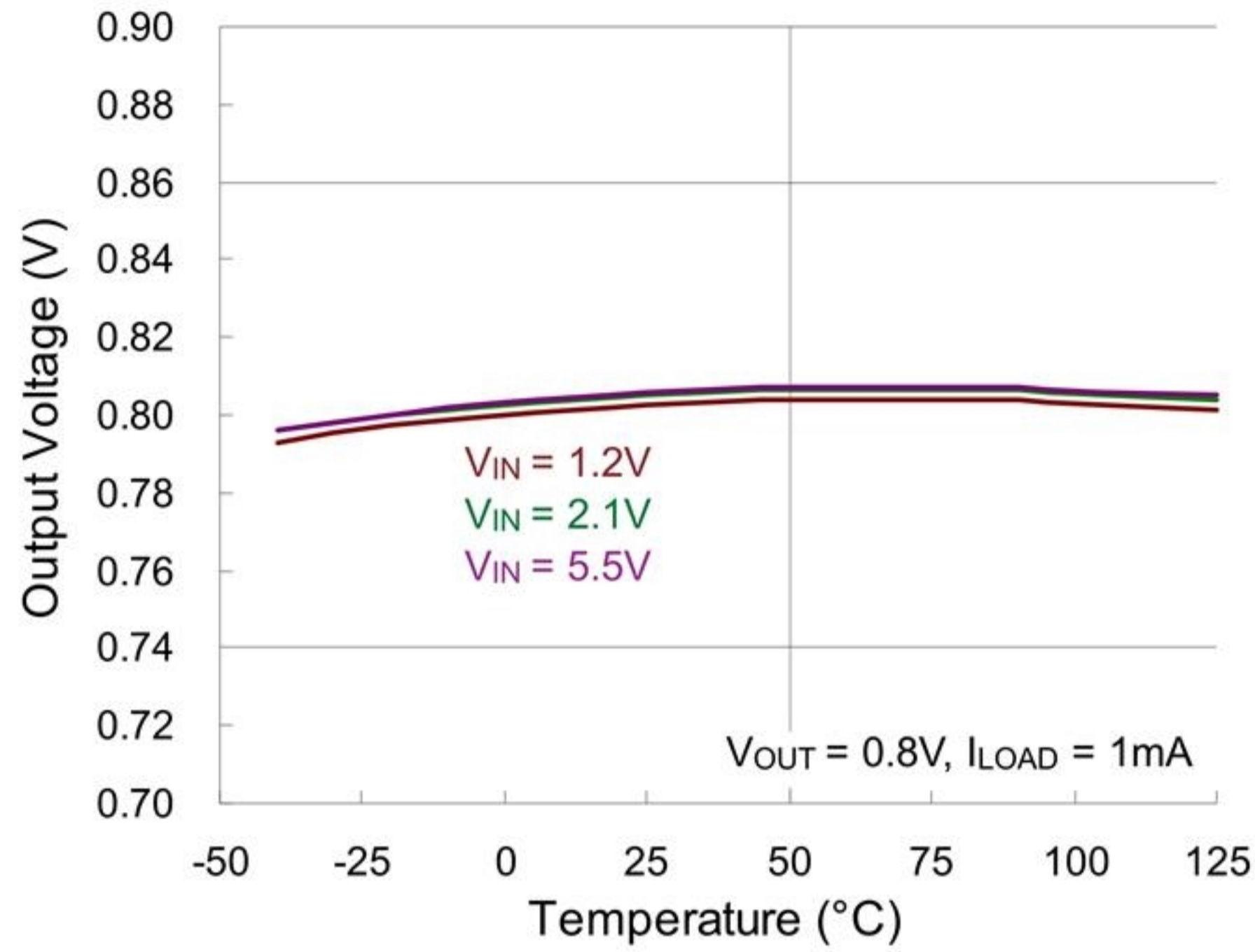


Table 1. Recommended External Components

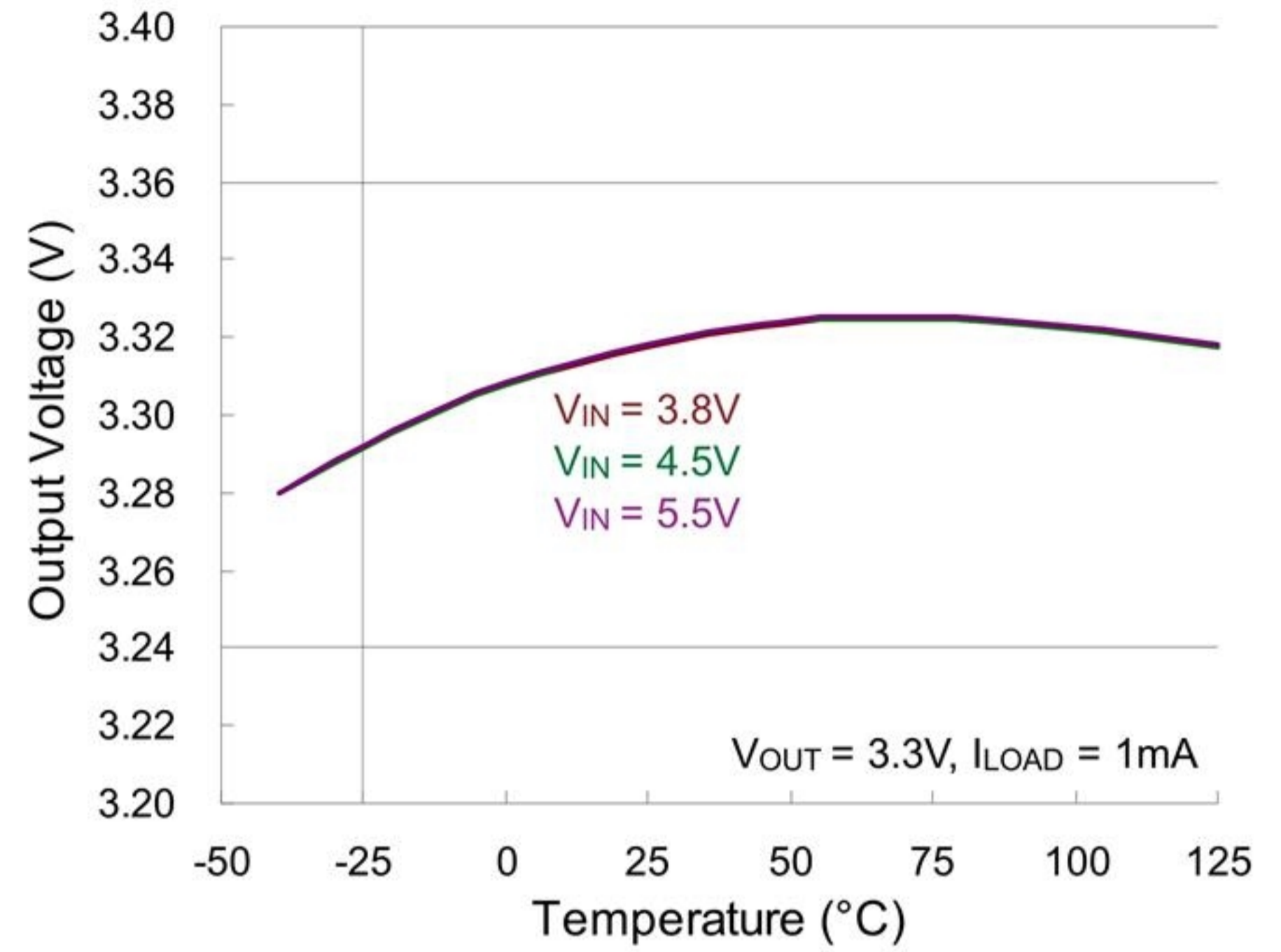
| Component | Description | Vendor P/N |
|--------------------|------------------------|--|
| C _{IN} | 1µF, 10V, X5R, 0402 | GRM155R61A105KE15 (Murata) |
| * C _{OUT} | 1µF, 6.3V, X5R, 0402 | GRM153R60J105ME95 (Murata) CGB2A3X5R0J105M033BB (TDK) |
| | 2.2µF, 6.3V, X5R, 0402 | GRM153R60J225ME95 (Murata) C1005X5R0J225M050BC (TDK) |
| | 4.7µF, 6.3V, X5R, 0402 | GRM153R60J475ME15 (Murata) C1005X5R0J475K050BE (TDK) |

Typical Operating Characteristics

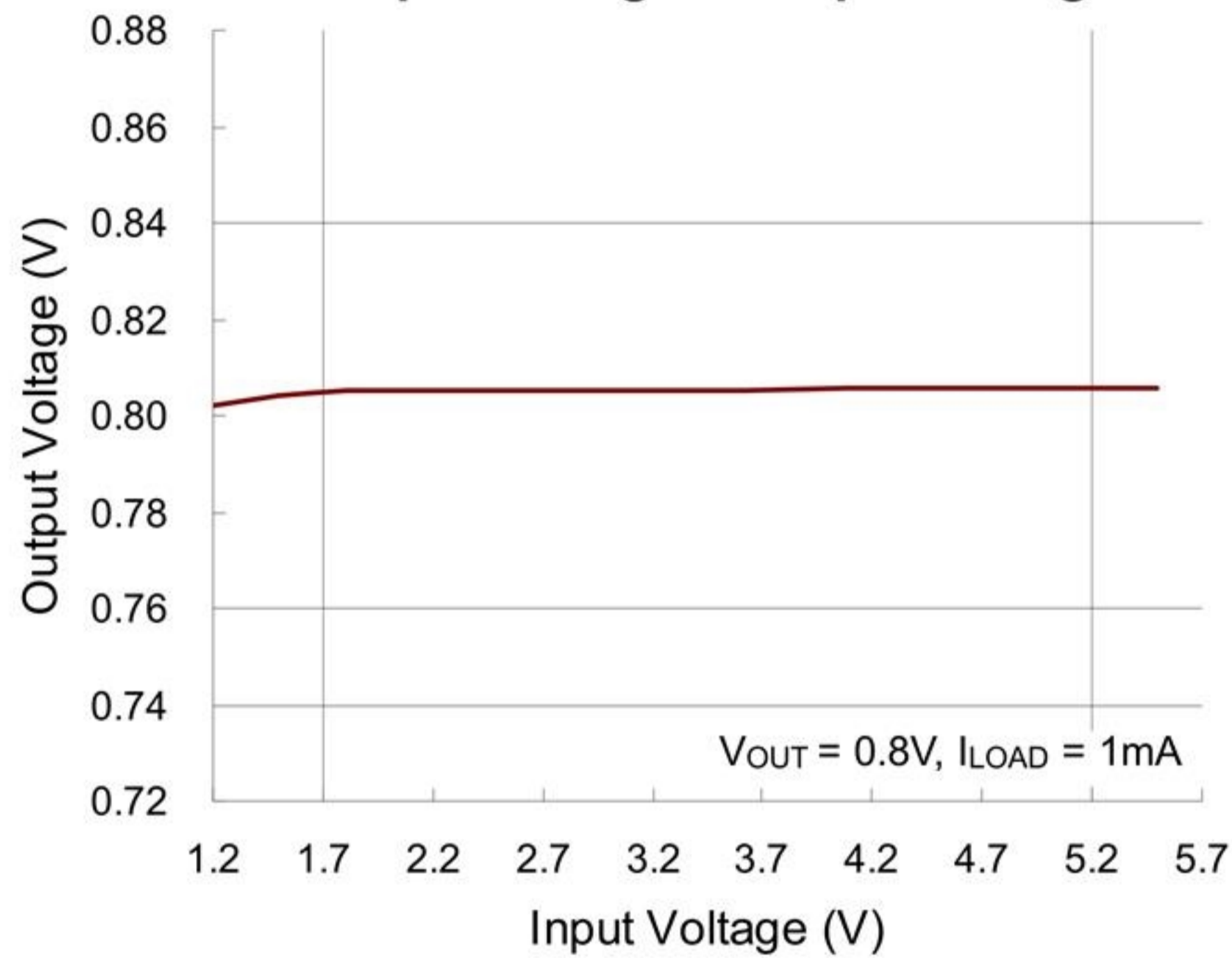
Output Voltage vs. Temperature



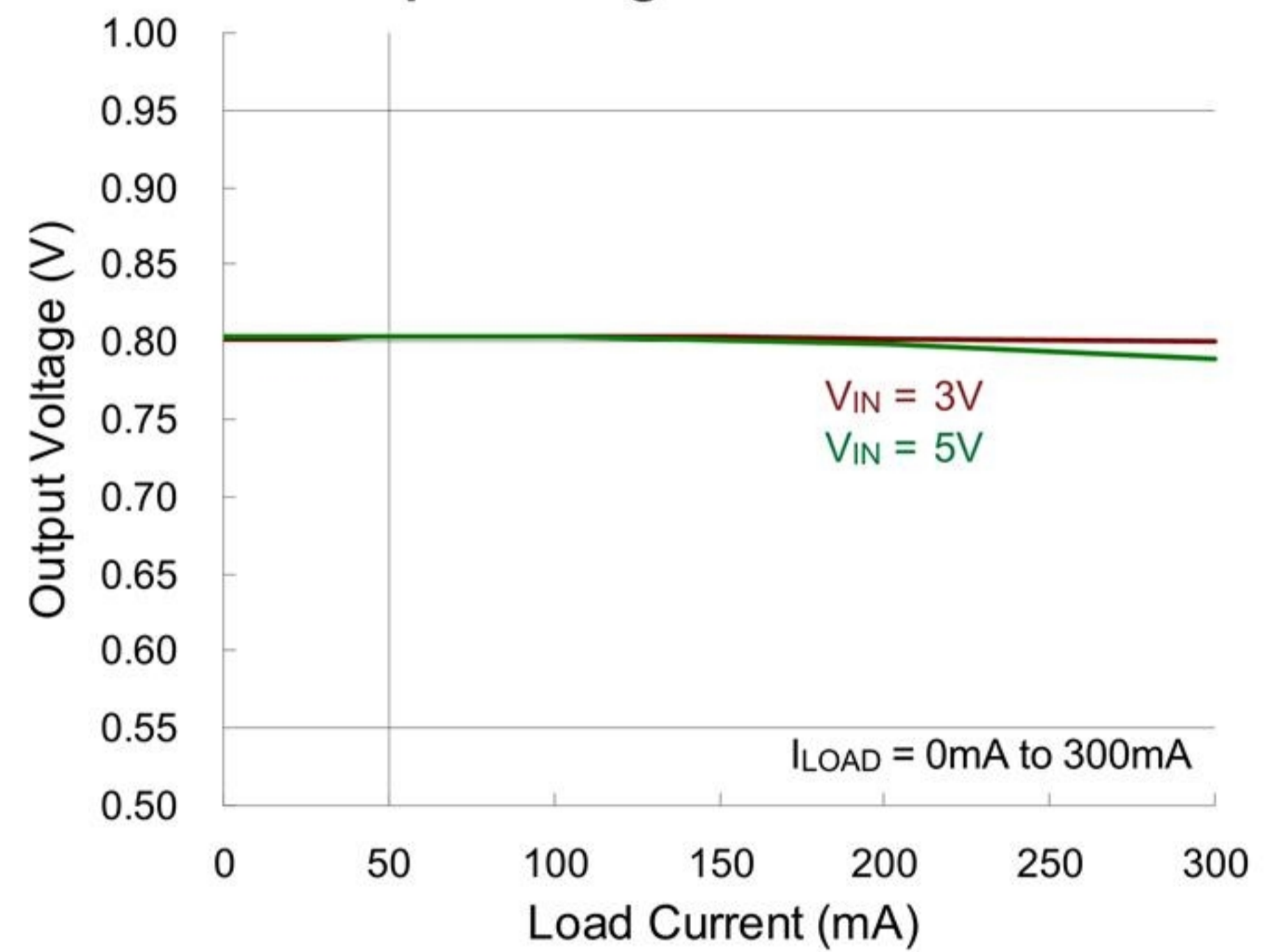
Output Voltage vs. Temperature



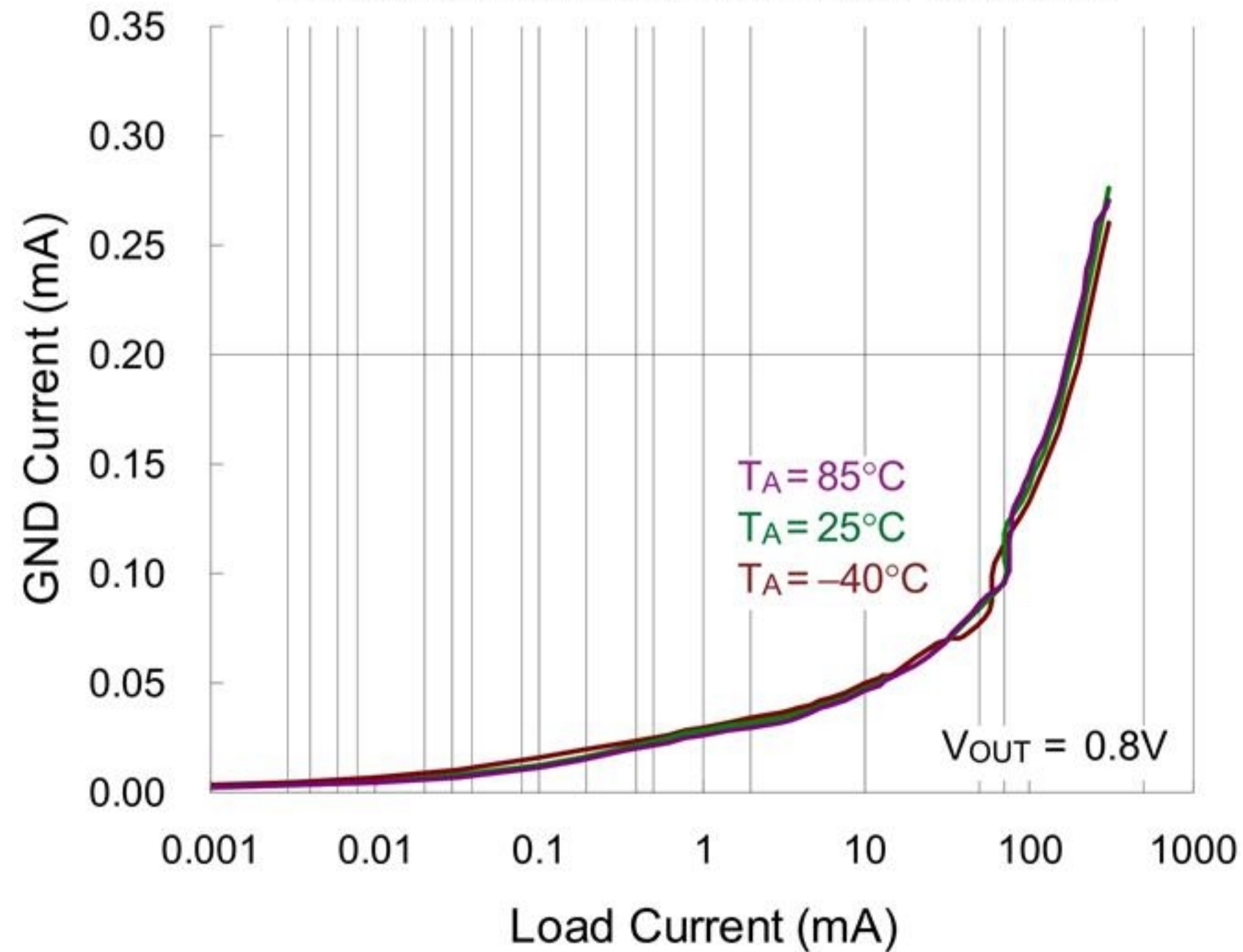
Output Voltage vs. Input Voltage



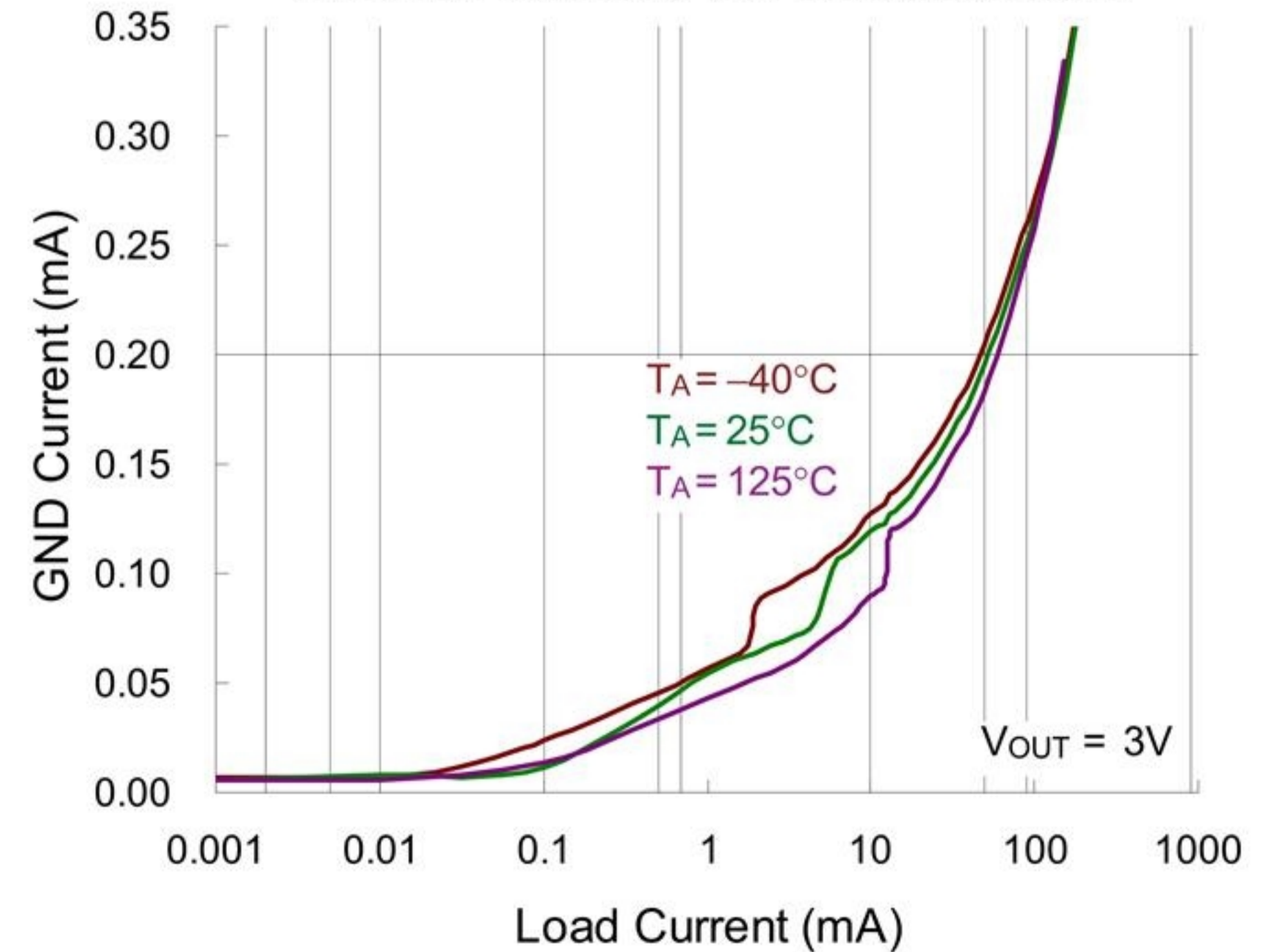
Output Voltage vs. Load Current

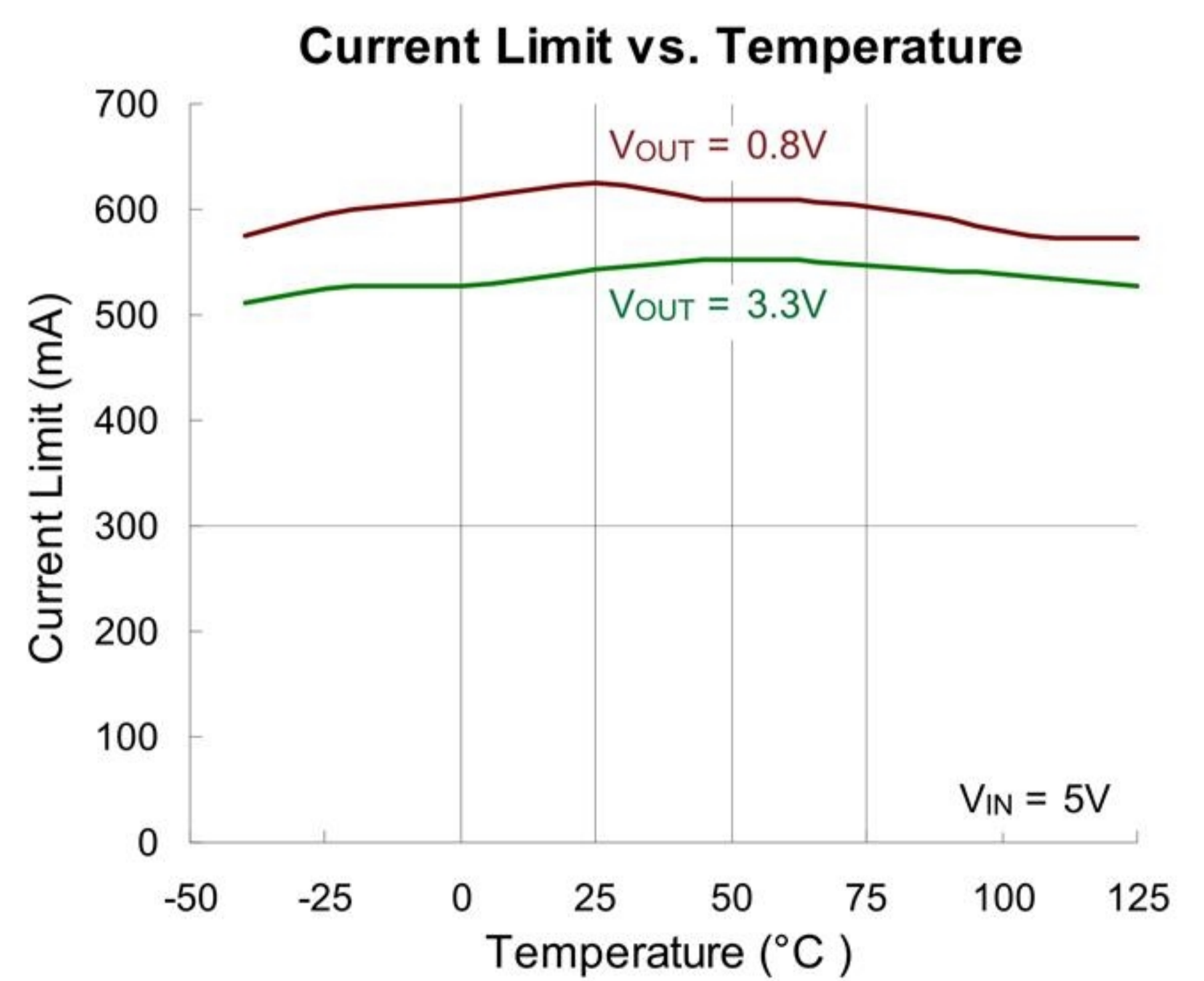
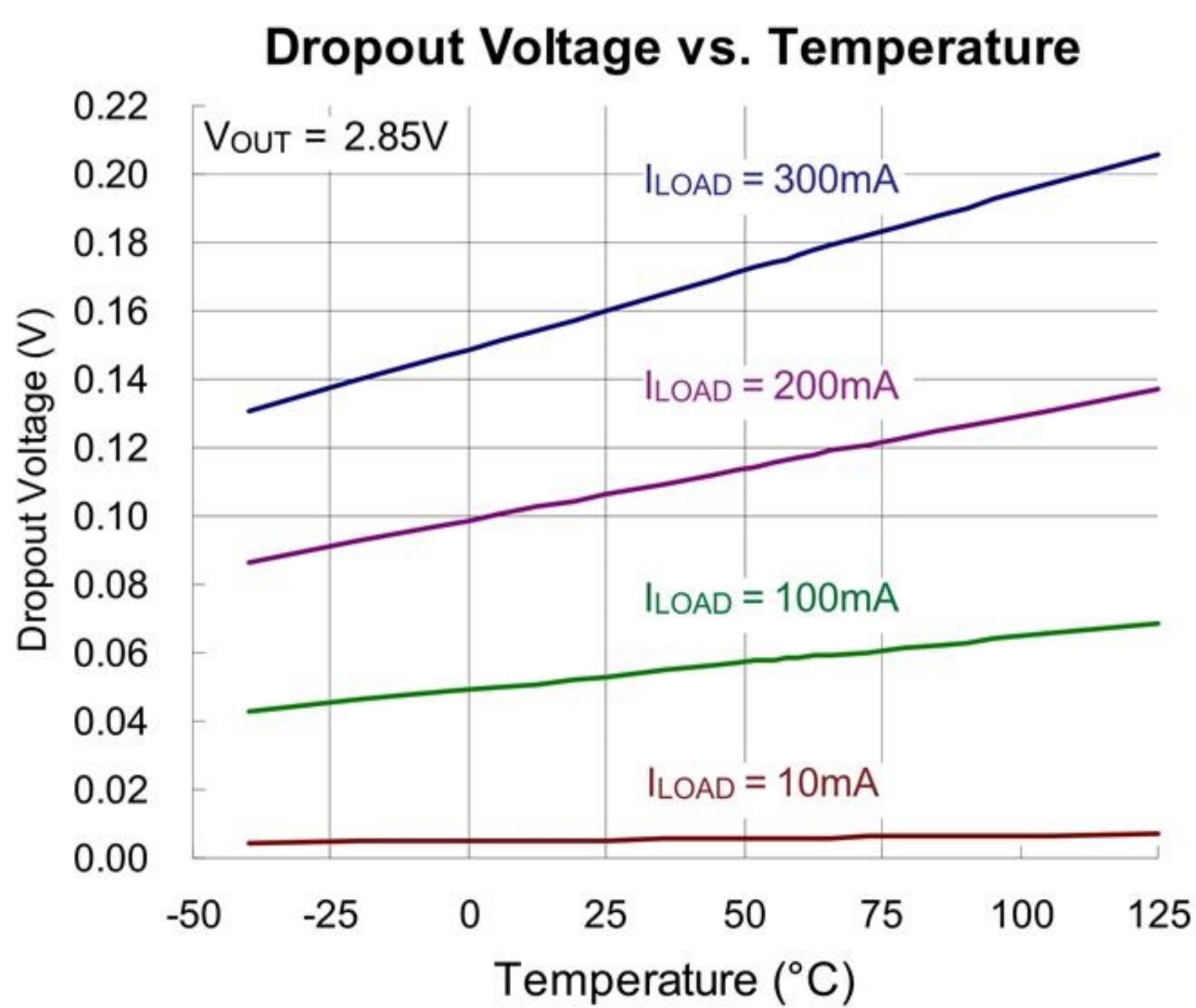
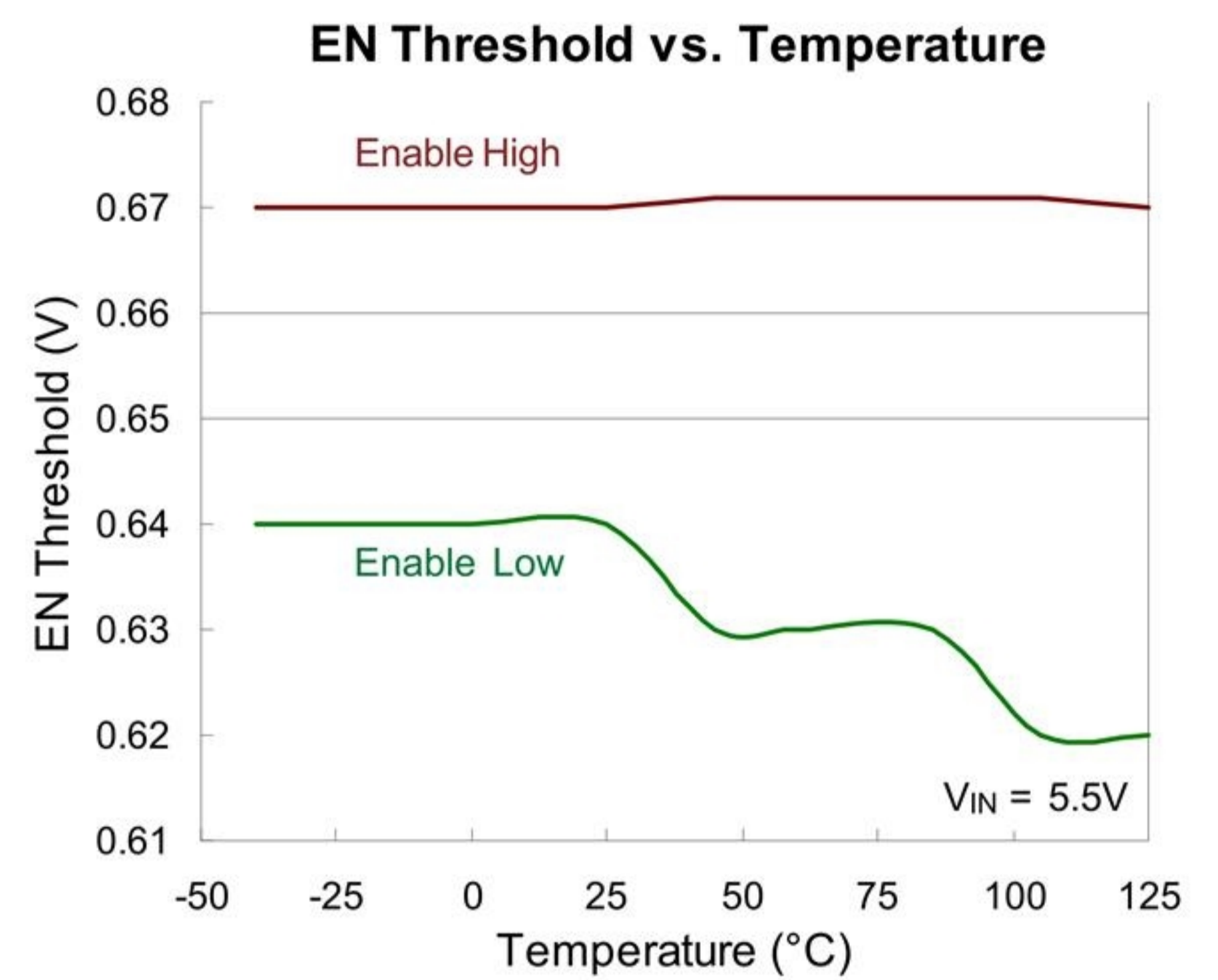
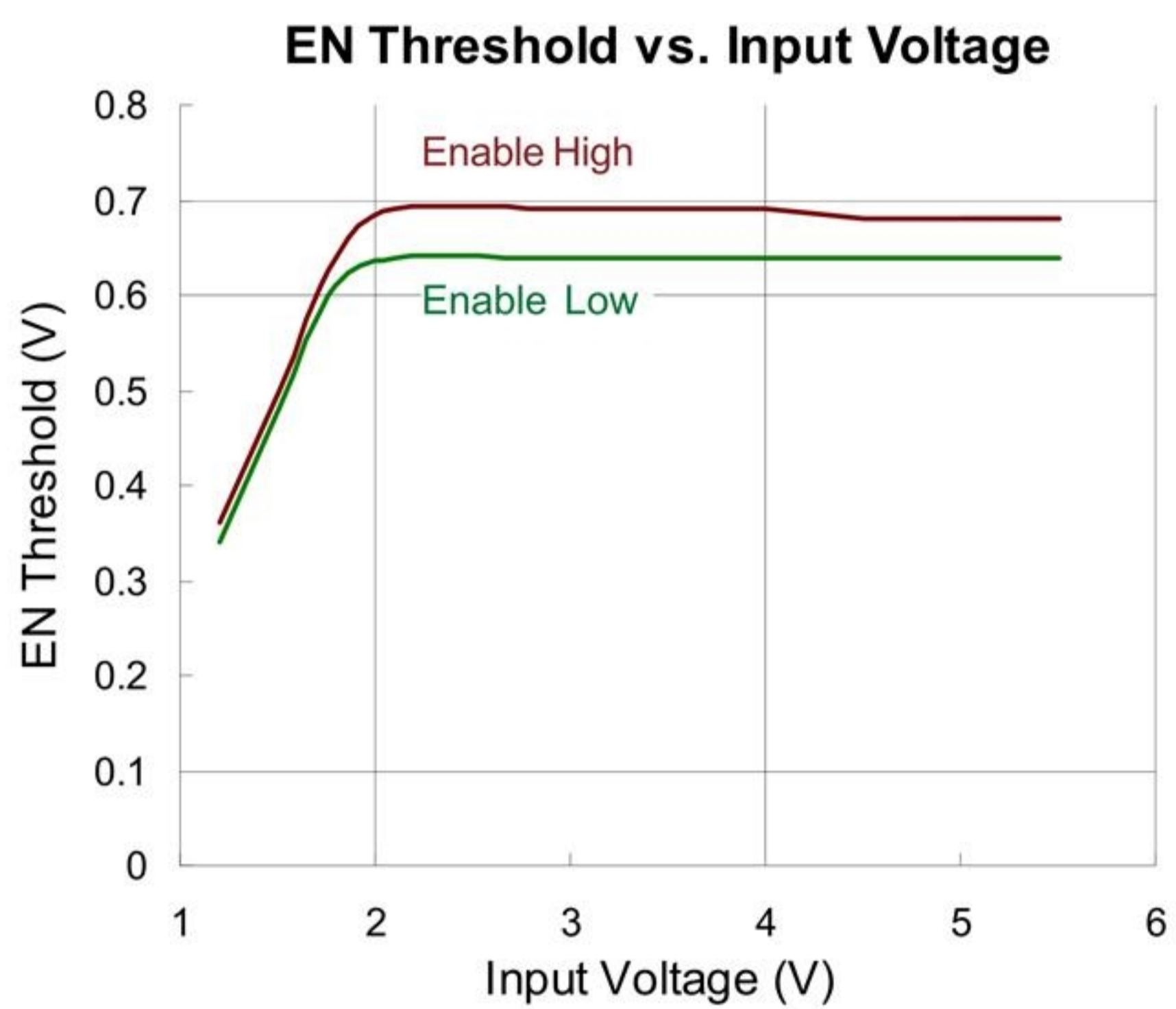
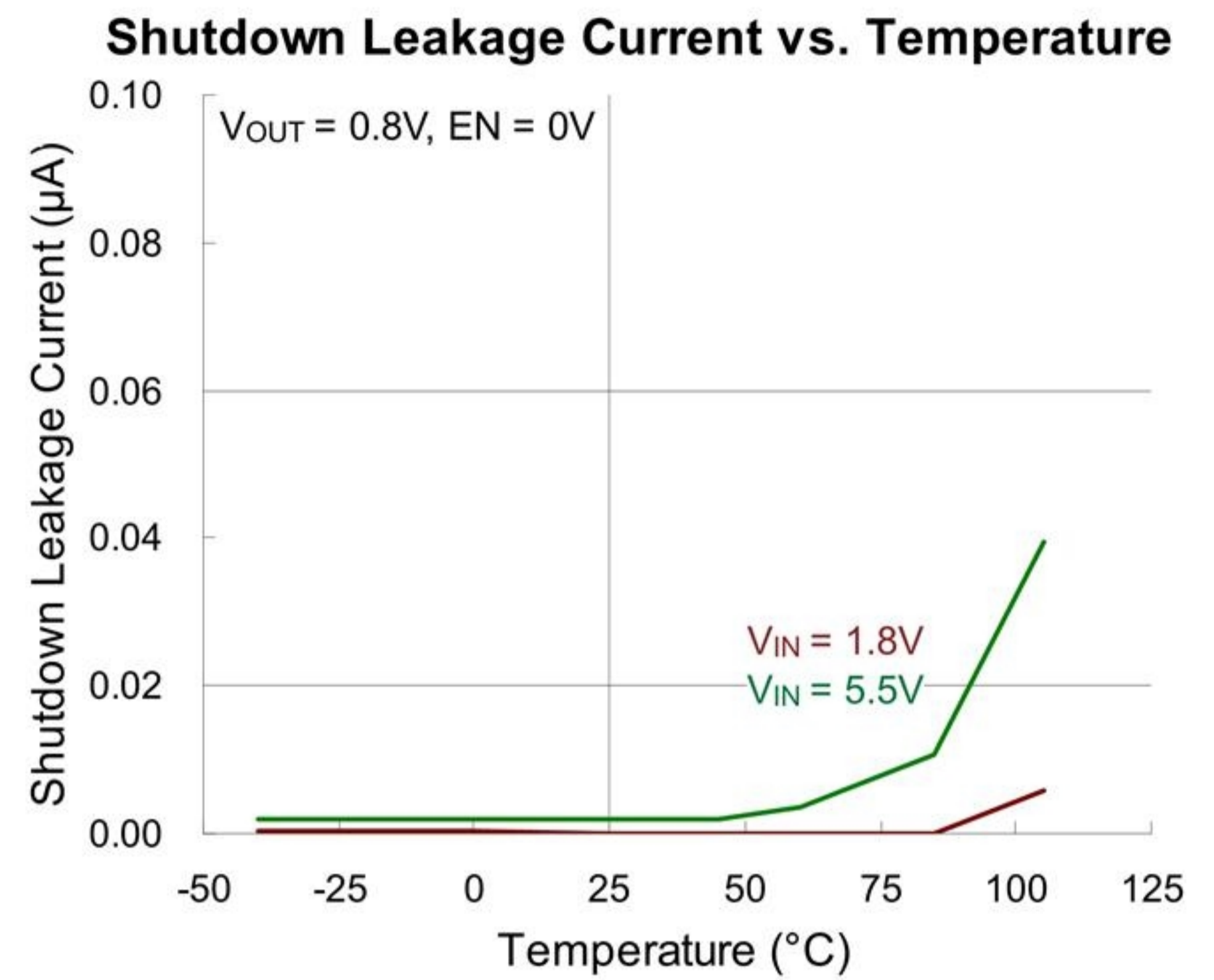
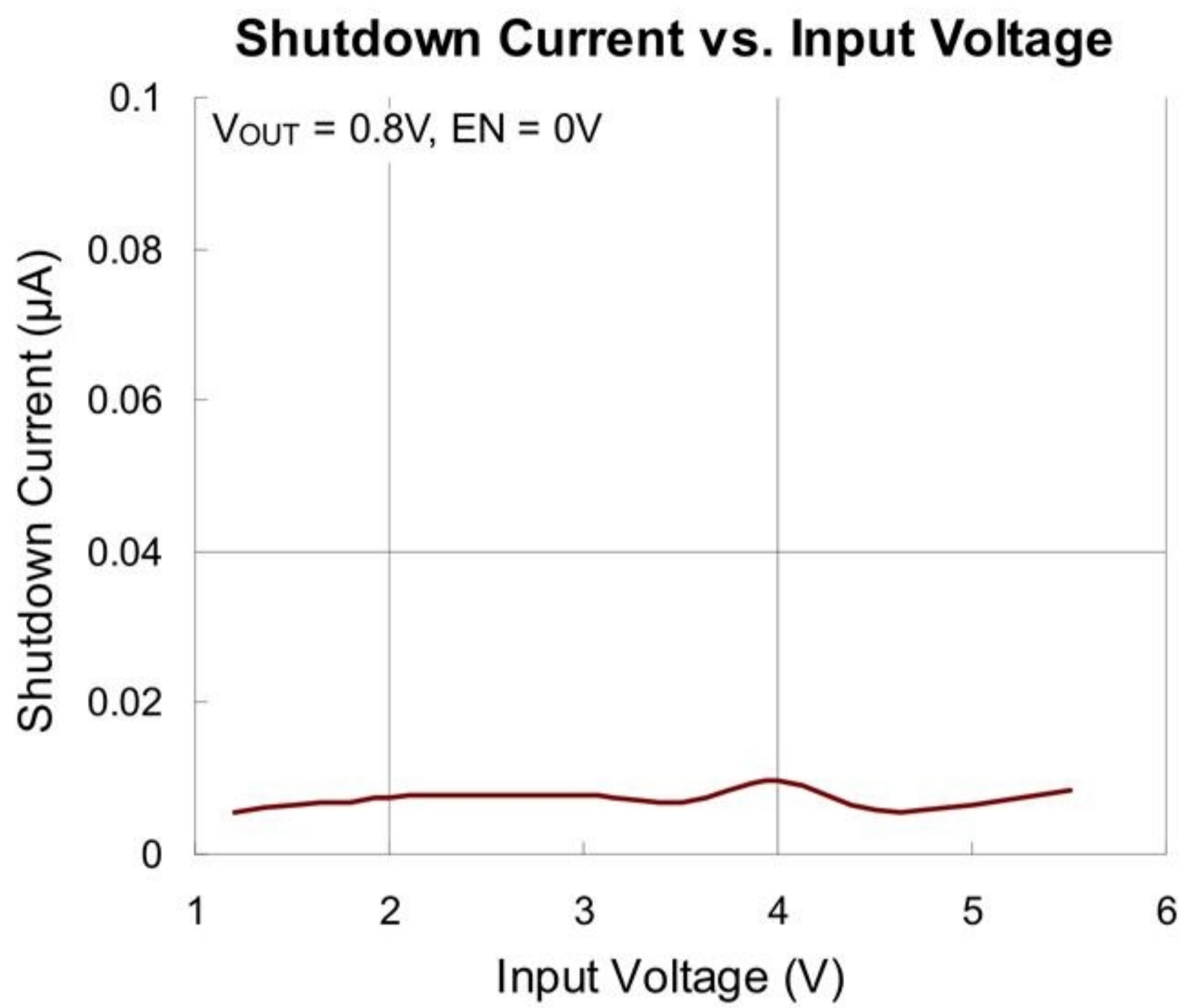


Ground Current vs. Load Current

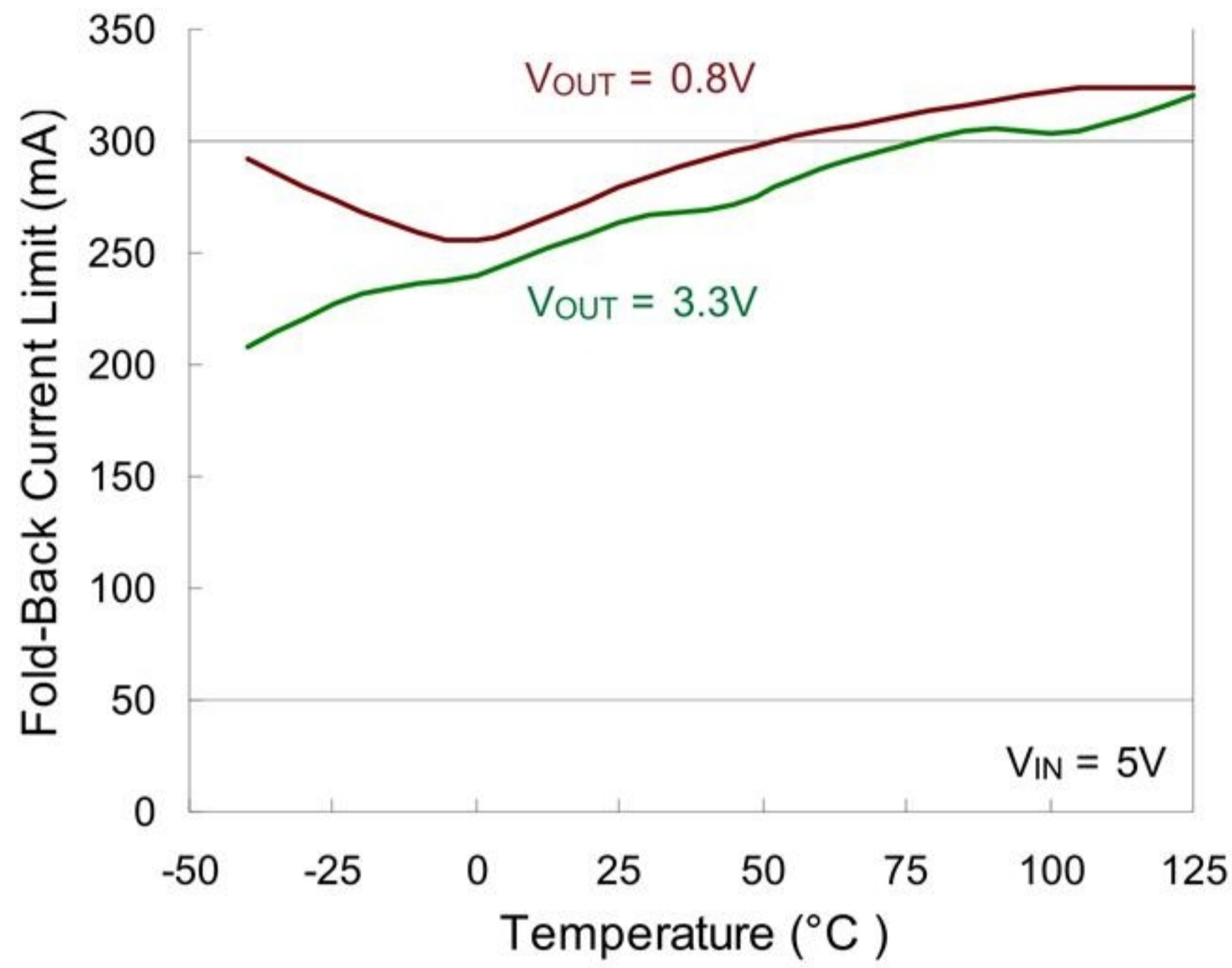


Ground Current vs. Load Current

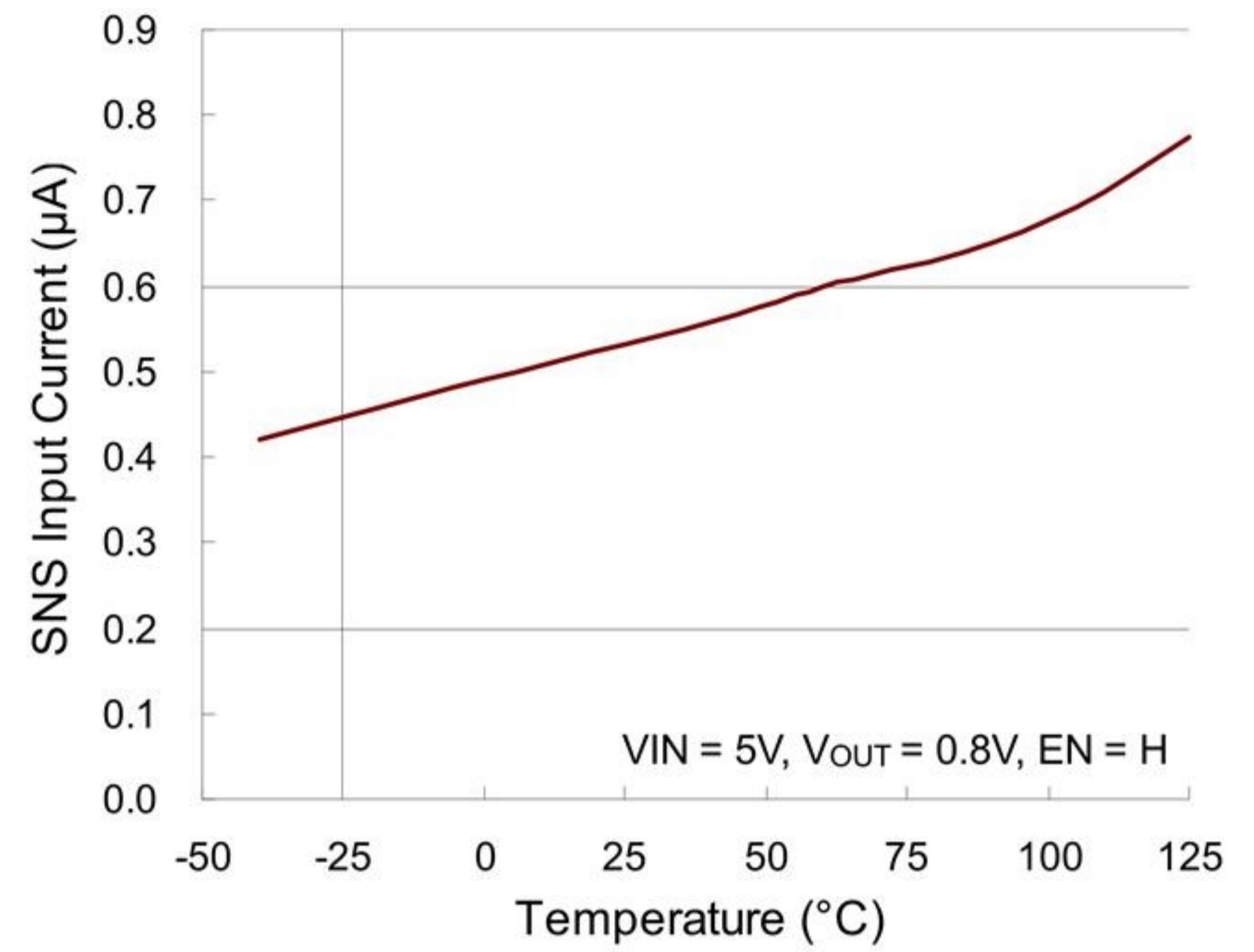




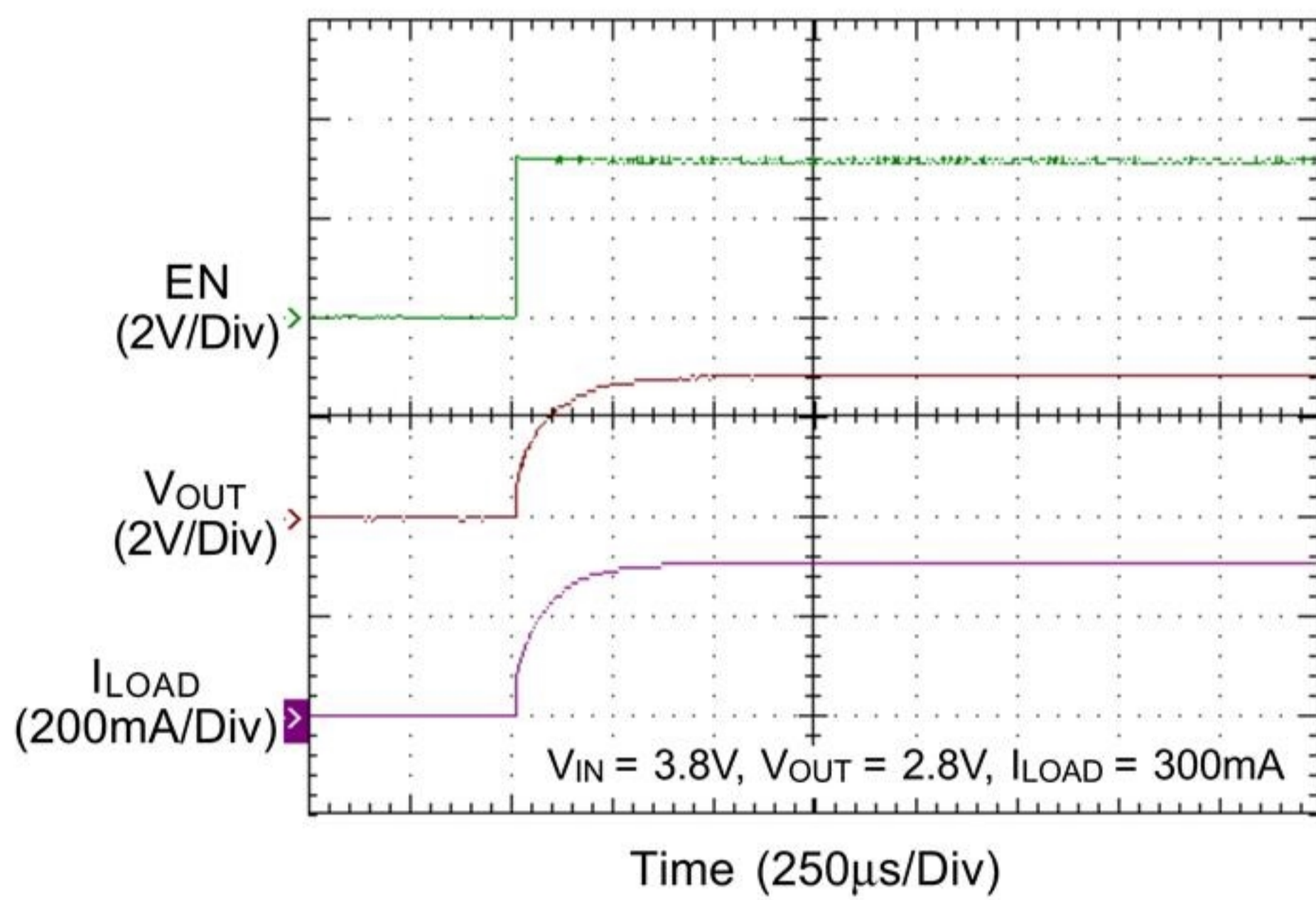
Fold-Back Current Limit vs. Temperature



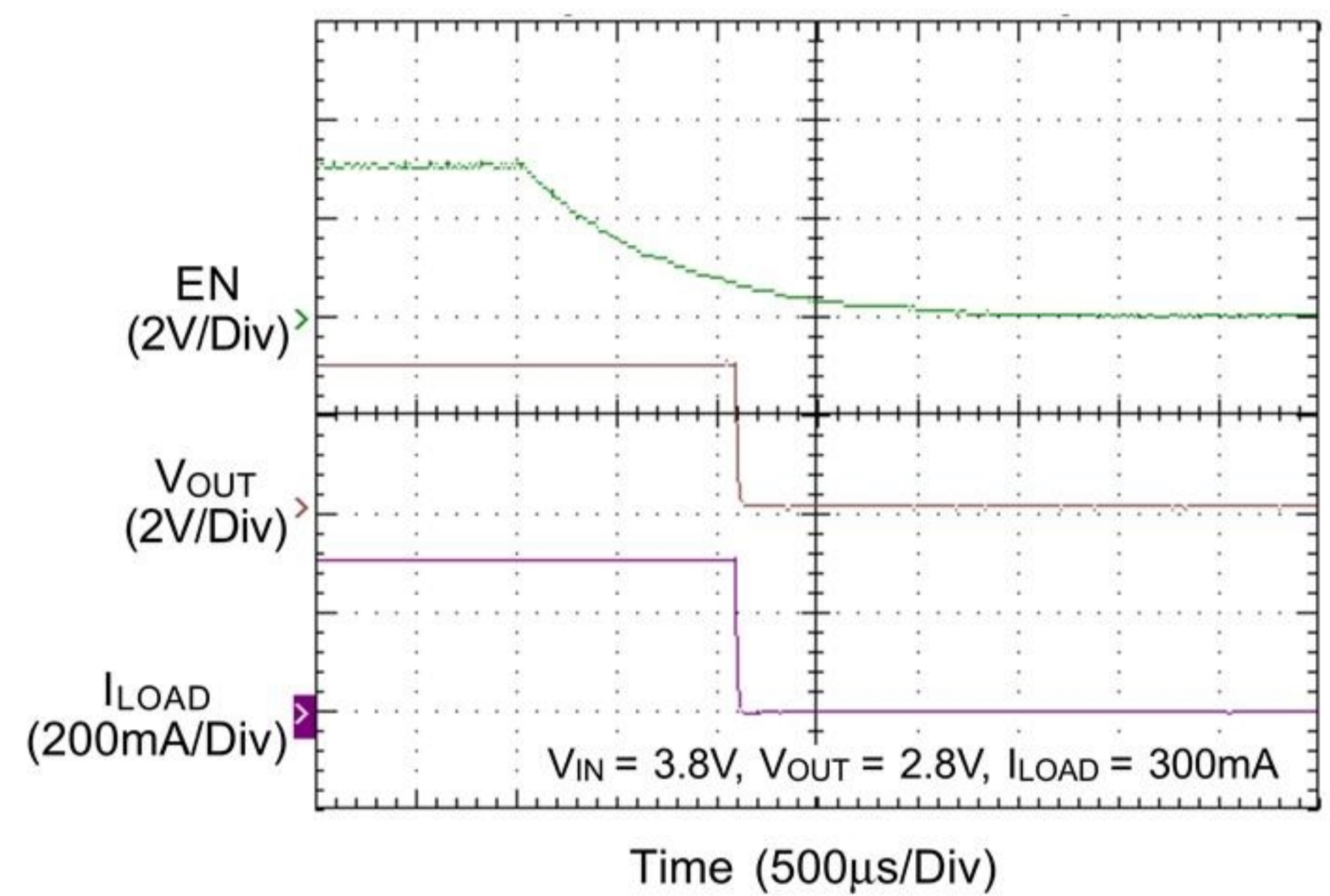
SNS Input Current vs. Temperature



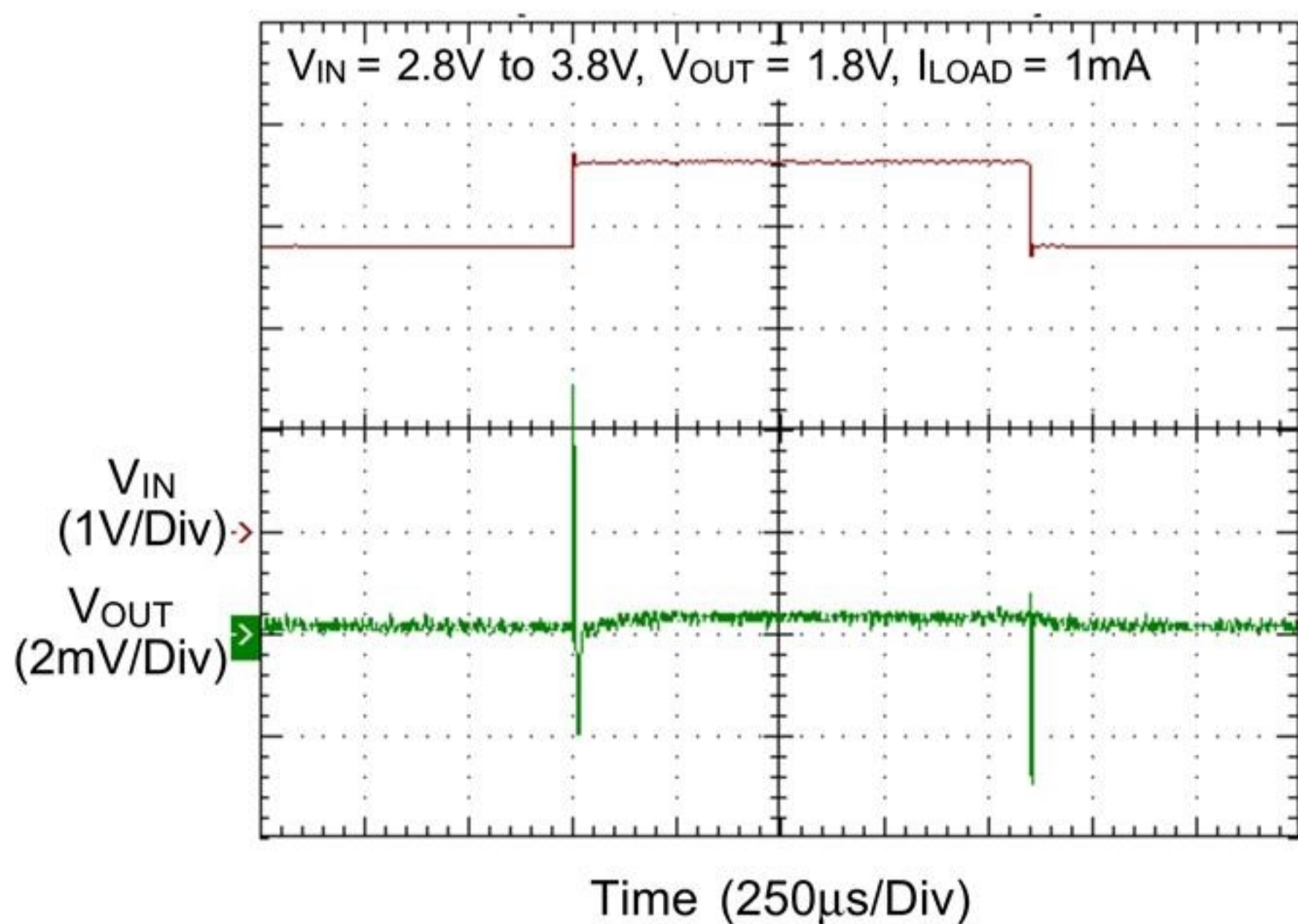
Power On from EN



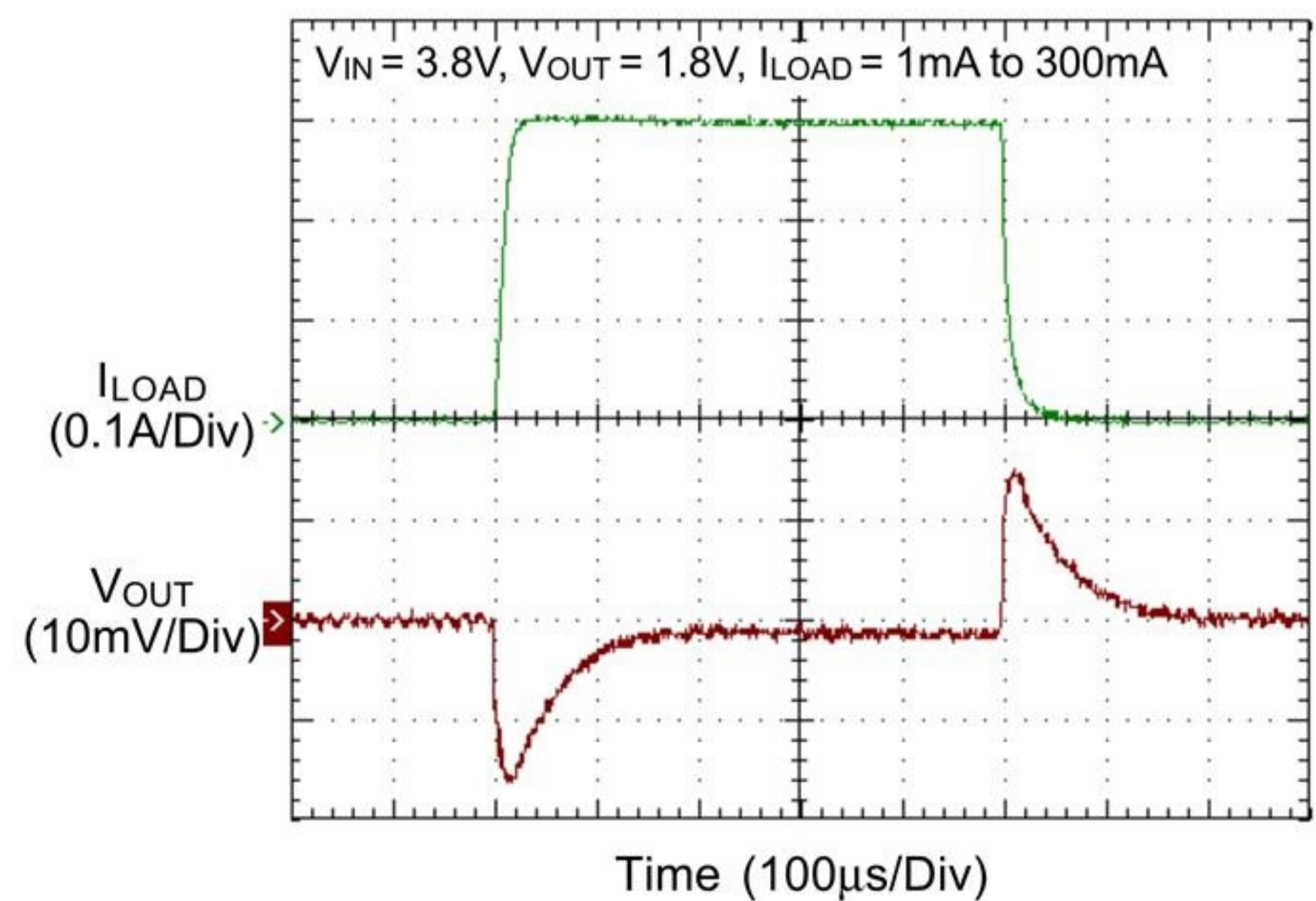
Power Off from EN



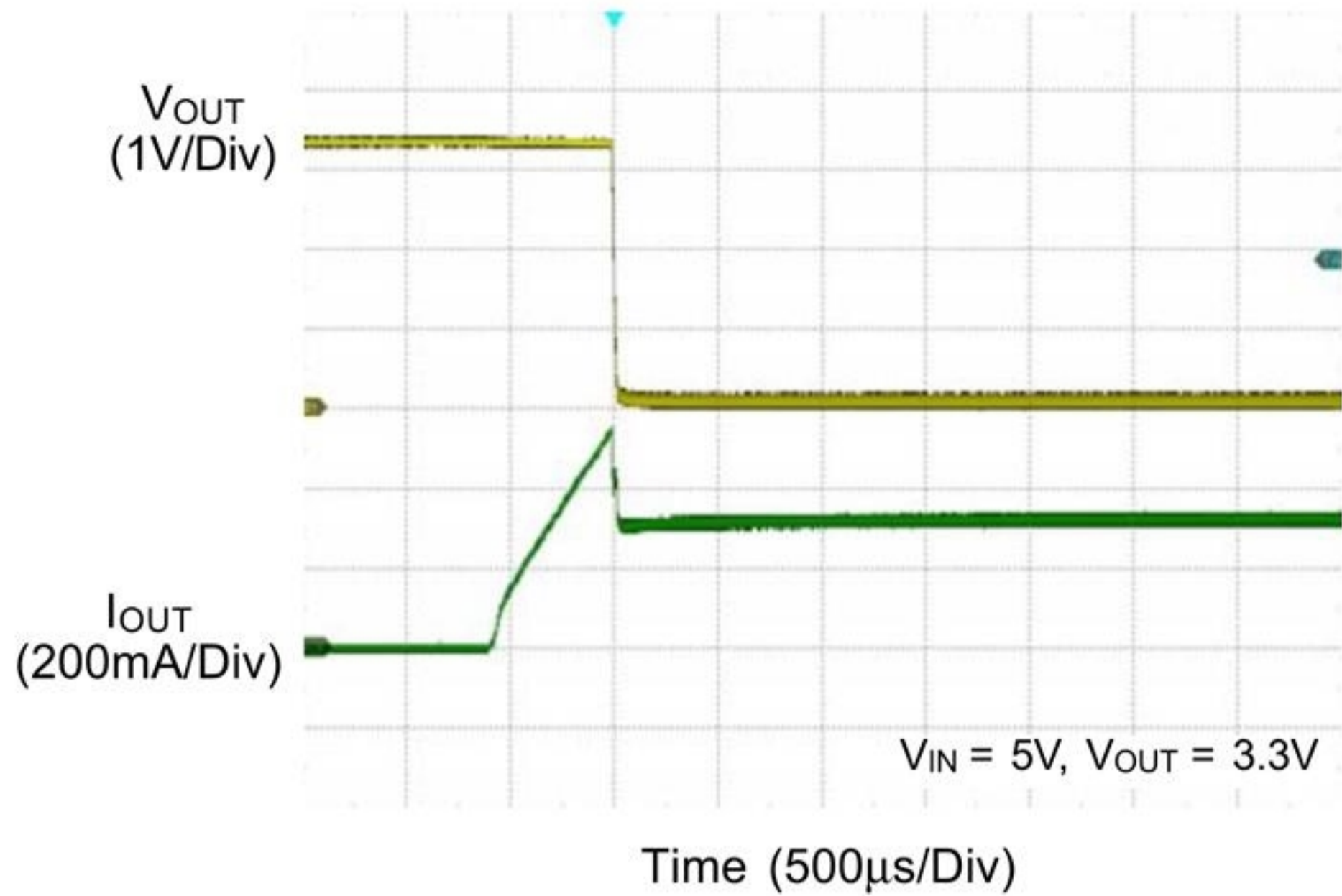
Line Transient



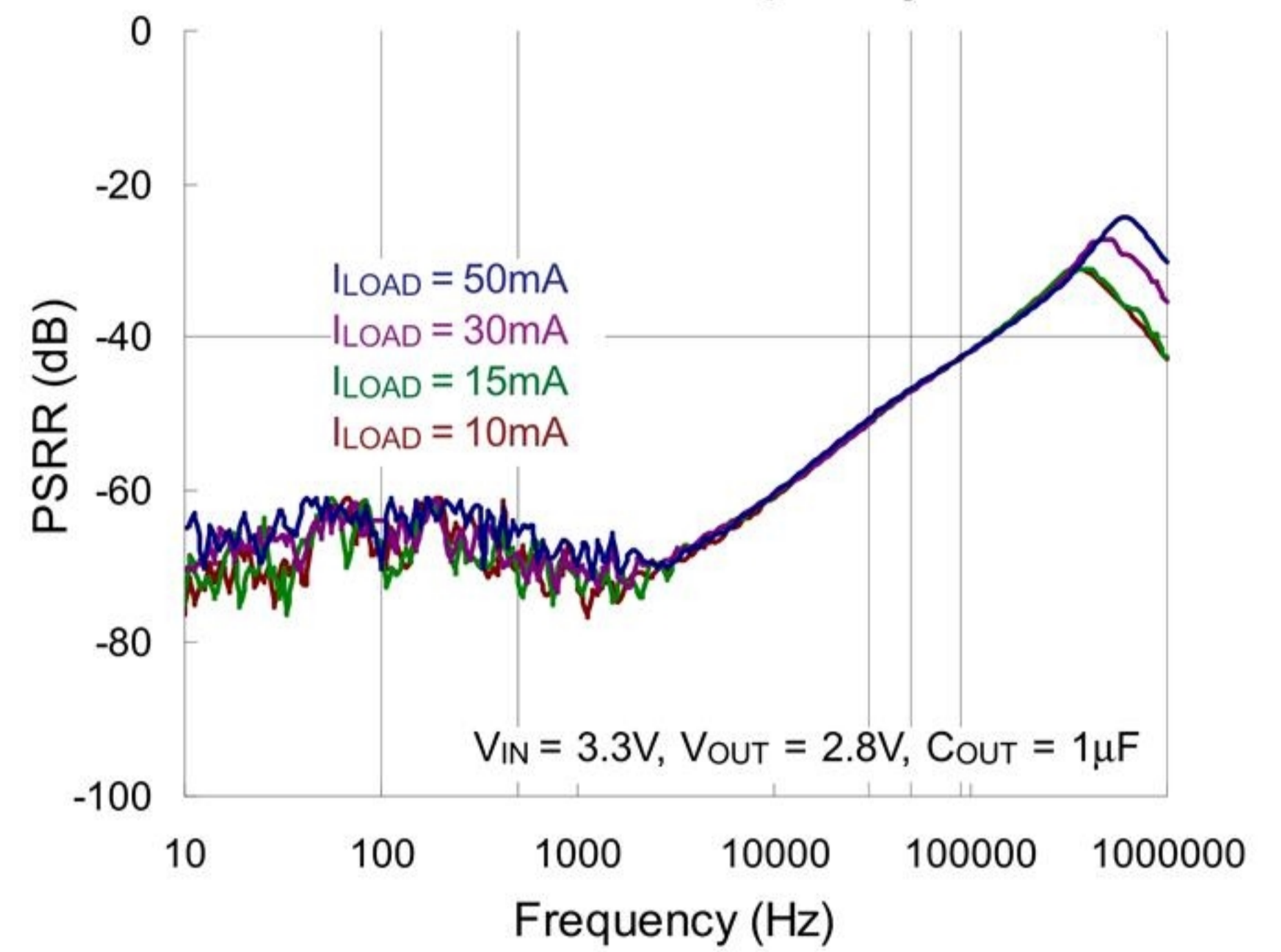
Load Transient



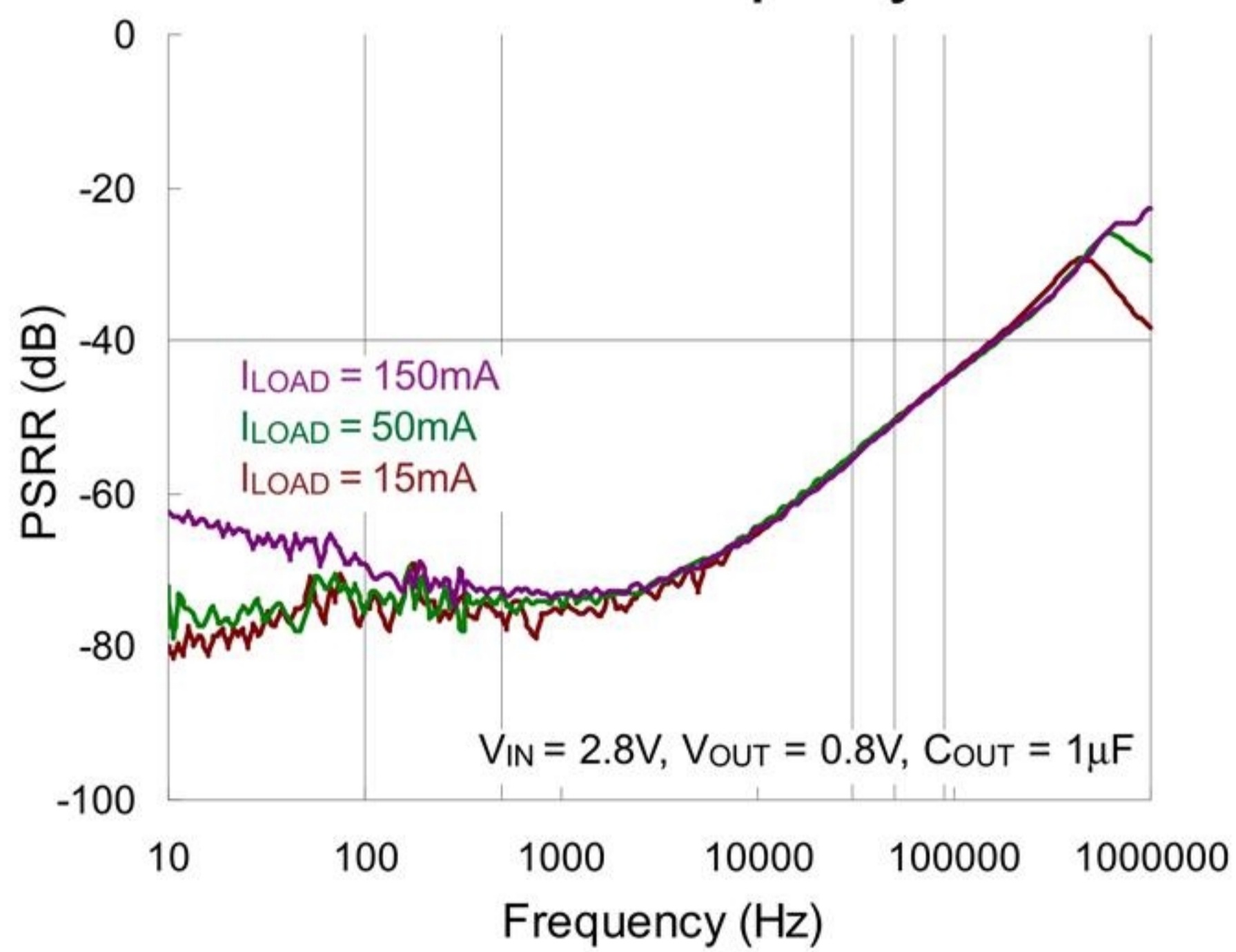
Output Current Limit Protection



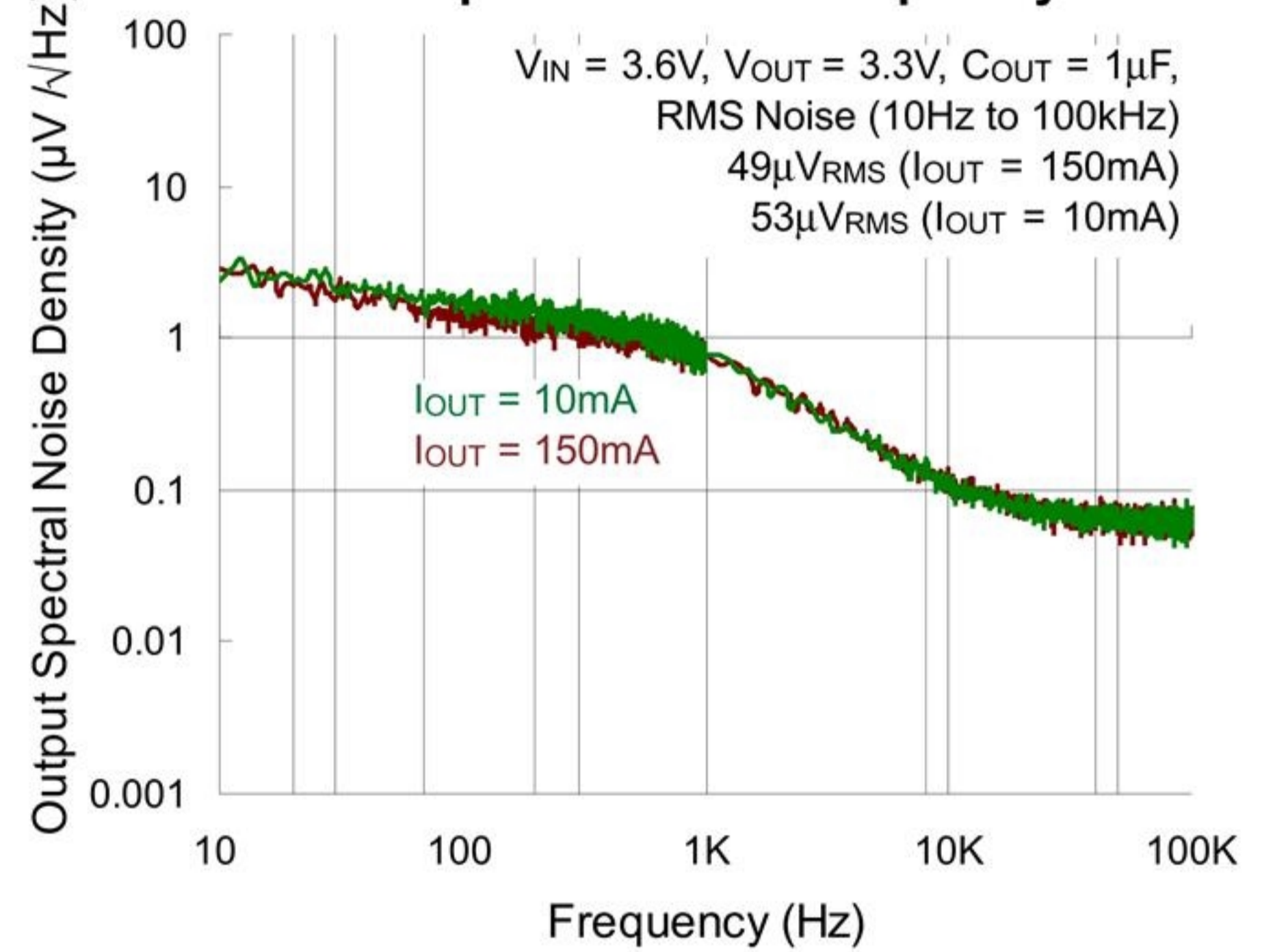
PSRR vs. Frequency



PSRR vs. Frequency

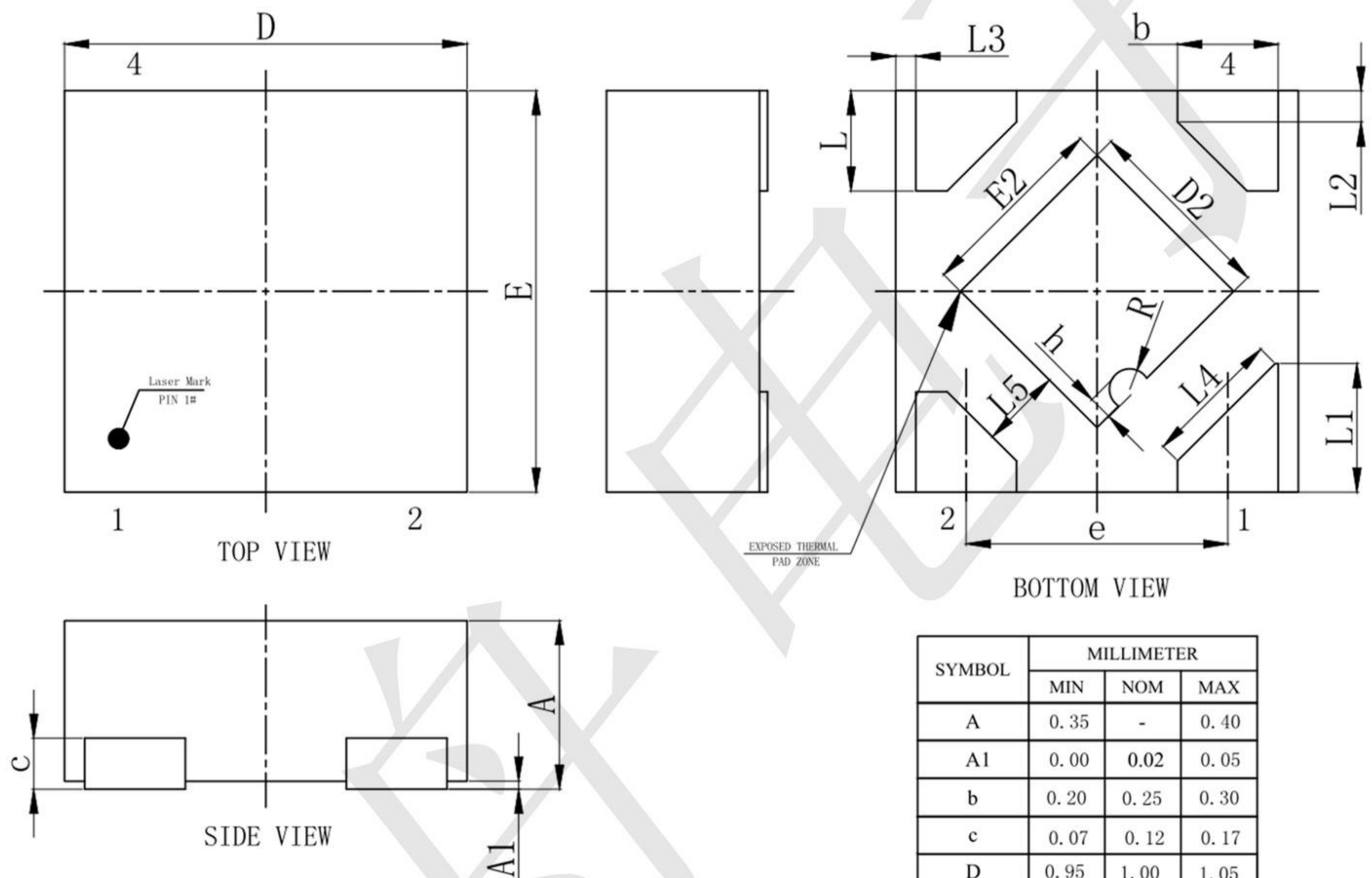


Output Noise vs. Frequency



Package information

DFN1X1-4 Outline Dimensions



| SYMBOL | MILLIMETER | | |
|--------|------------|------|------|
| | MIN | NOM | MAX |
| A | 0.35 | - | 0.40 |
| A1 | 0.00 | 0.02 | 0.05 |
| b | 0.20 | 0.25 | 0.30 |
| c | 0.07 | 0.12 | 0.17 |
| D | 0.95 | 1.00 | 1.05 |
| D2 | 0.38 | 0.48 | 0.58 |
| e | 0.65BSC | | |
| E | 0.95 | 1.00 | 1.05 |
| E2 | 0.38 | 0.48 | 0.58 |
| L | 0.20 | 0.25 | 0.30 |
| L1 | 0.27 | 0.32 | 0.37 |
| L2 | 0.077REF | | |
| L3 | 0.05REF | | |
| L4 | 0.34REF | | |
| L5 | 0.20REF | | |
| R | 0.05REF | | |
| h | 0.06REF | | |