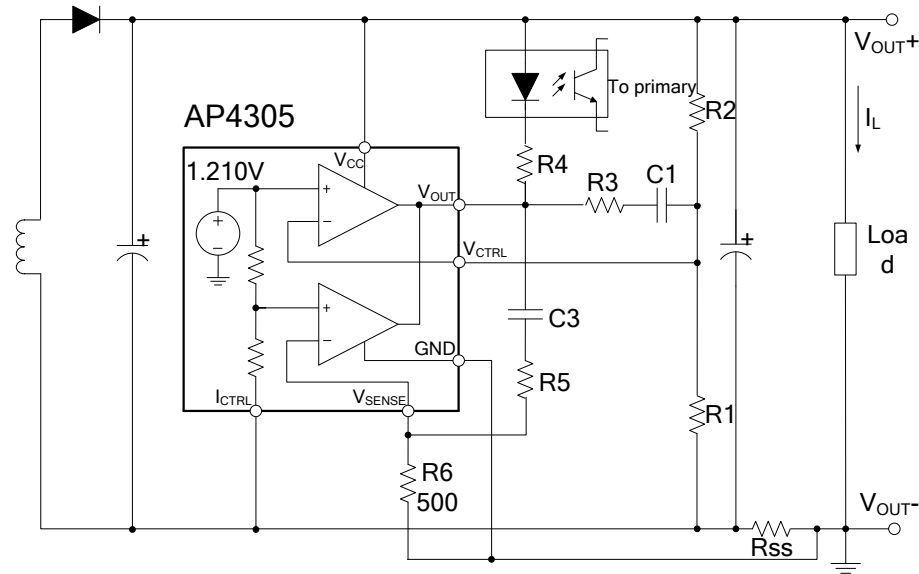


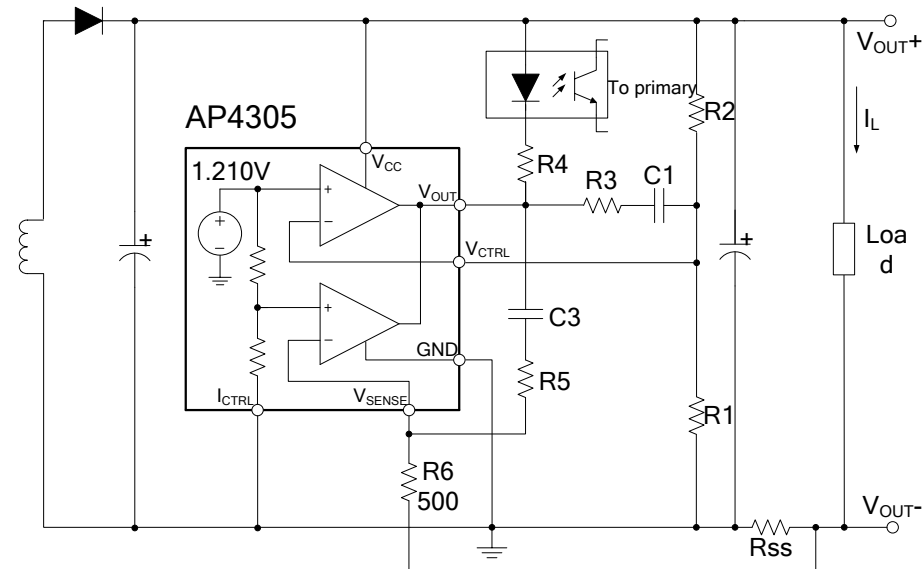
Typical Applications Circuit (Cont.)



$$V_{OUT} = [V_{REF} + (I_L \times R_{SS})] \times \frac{R1 + R2}{R1} - (I_L \times R_{SS}) \text{ (V)}$$

$$CurrentLimit = \frac{V_{SENSE}}{R_{SS}} \text{ (A)}$$

Typical Application 2



$$V_{OUT} = V_{REF} \times \frac{R1 + R2}{R1} - (I_L \times R_{SS}) \text{ (V)}$$

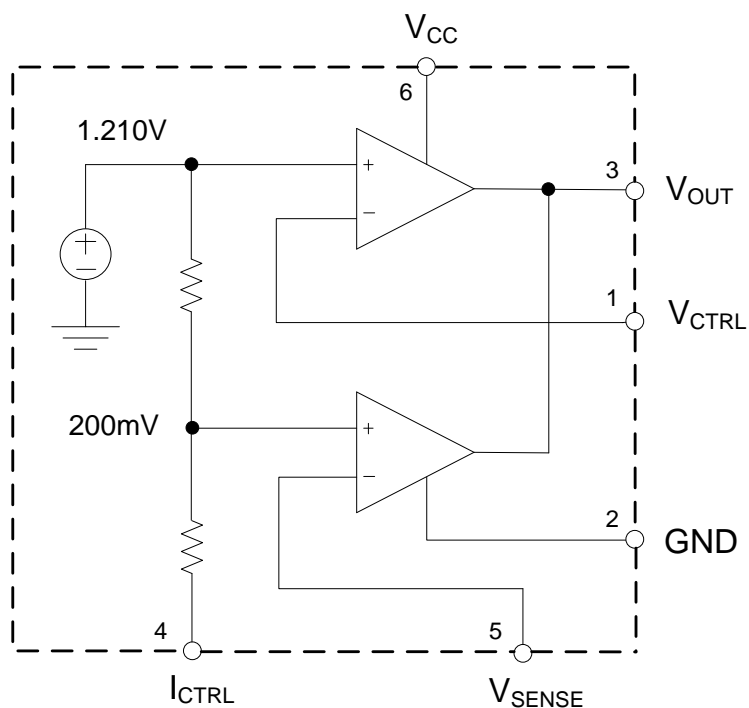
$$CurrentLimit = \frac{V_{SENSE} \times V_{REF}}{(V_{SENSE} + V_{REF}) \times R_{SS}} \text{ (A)}$$

Typical Application 3

Pin Descriptions

| Pin Number | Pin Name | Function |
|------------|-------------|---------------------------------------|
| 1 | V_{CTRL} | Input pin of the voltage control loop |
| 2 | GND | Ground |
| 3 | V_{OUT} | Output pin. Sinking current only |
| 4 | I_{CTRL} | Input pin of the current control loop |
| 5 | V_{SENSE} | Input pin of the current control loop |
| 6 | V_{CC} | Power supply |

Functional Block Diagram



Absolute Maximum Ratings (Note 4)

| Symbol | Parameter | Rating | Unit |
|---------------|---|------------------|------|
| V_{CC} | Power Supply Voltage | 20 | V |
| V_{IN} | Input Voltage | -0.3 to V_{CC} | V |
| T_J | Junction Temperature | +150 | °C |
| T_{STG} | Storage Temperature | -65 to +150 | °C |
| T_{LEAD} | Lead Temperature (Soldering, 5sec) | +260 | °C |
| θ_{JC} | Package Thermal Resistance (Junction to Case) | 92 | °C/W |

Note 4: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

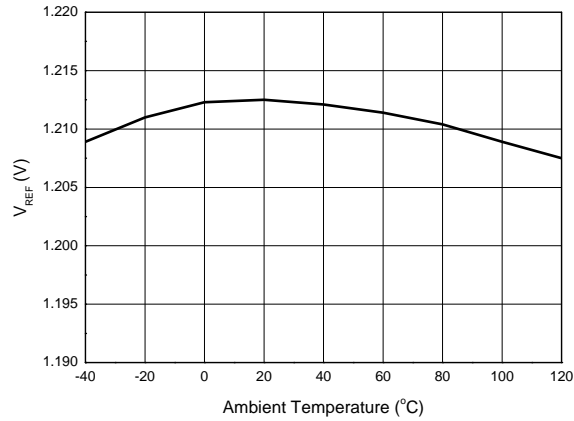
| Symbol | Parameter | Min | Max | Unit |
|----------|-----------------------------|-----|------|------|
| V_{CC} | Power Supply Voltage | 2.5 | 18 | V |
| T_A | Operating Temperature Range | -40 | +105 | °C |

Electrical Characteristics ($V_{CC}=5V$, $T_A=+25^{\circ}C$, unless otherwise specified.)

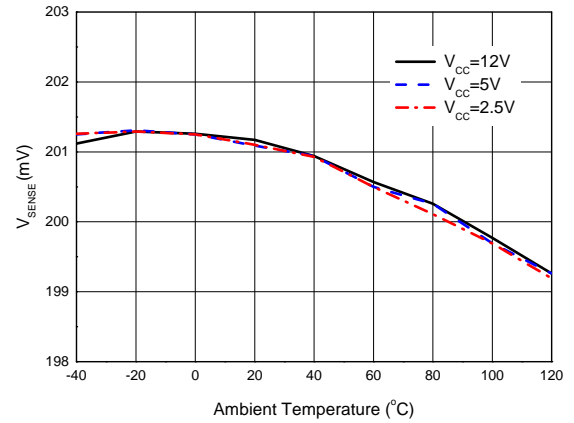
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------------------|--|--|-------|------|-------|-------|
| TOTAL CURRENT CONSUMPTION | | | | | | |
| I _{CC} | Total Supply Current Not Including the Output Sinking Current | T _A =+25°C | – | 0.5 | 1 | mA |
| | | -40°C<T _A < +105°C | – | 0.6 | – | |
| VOLTAGE CONTROL LOOP | | | | | | |
| G _{mv} | Transconduction Gain (V _{CTRL}). Sink Current Only | T _A =+25°C | 1 | 3.5 | – | mA/mV |
| | | -40°C<T _A < +105°C | – | 2.5 | – | |
| V _{REF} | Voltage Control Loop Reference | T _A =+25°C | 1.204 | 1.21 | 1.216 | V |
| | | -40°C<T _A < +105°C | 1.186 | – | 1.234 | |
| I _{IBV} | Input Bias Current (V _{CTRL}) | T _A =+25°C | – | 50 | – | nA |
| | | -40°C<T _A < +105°C | – | 100 | – | |
| CURRENT CONTROL LOOP | | | | | | |
| G _{mi} | Transconduction Gain (I _{CTRL}). Sink Current Only | T _A =+25°C | 1.5 | 7 | – | mA/mV |
| V _{SENSE} | Current Control Loop Reference | I _{OUT} =2.5mA, T _A =+25°C | 198 | 200 | 202 | mV |
| | | I _{OUT} =2.5mA, -40°C<T _A < +105°C | 192 | – | 208 | |
| I _{IBI} | Current Out of Pin I _{CTRL} at 200mV | T _A =+25°C | – | 25 | – | μA |
| | | -40°C<T _A < +105°C | – | 50 | – | |
| OUTPUT STAGE | | | | | | |
| V _{OL} | Low Output Voltage at 10mA Sinking Current | T _A =+25°C | – | 200 | – | mV |
| I _{OS} | Output Short Circuit Current. Output to V _{CC} , Sink Current Only | T _A =+25°C | – | 27 | 50 | mA |
| | | -40°C<T _A < +105°C | – | 35 | – | |

Performance Characteristics

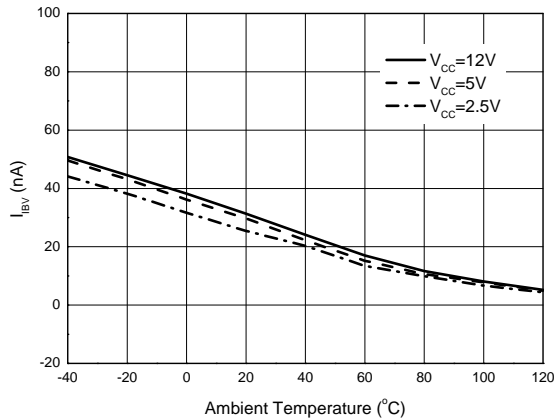
V_{REF} vs. Ambient Temperature



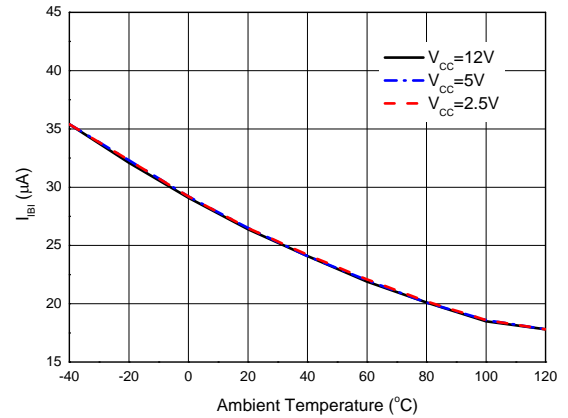
V_{SENSE} vs. Ambient Temperature



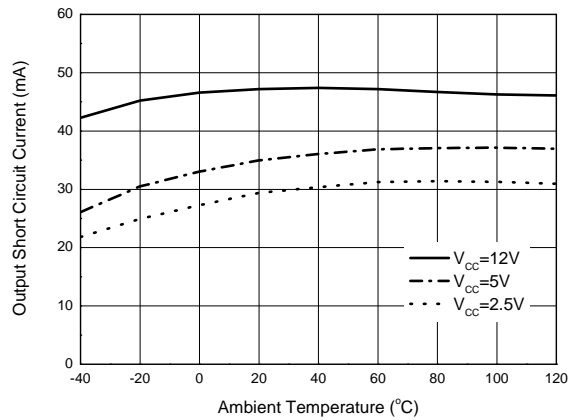
I_{IBV} vs. Ambient Temperature



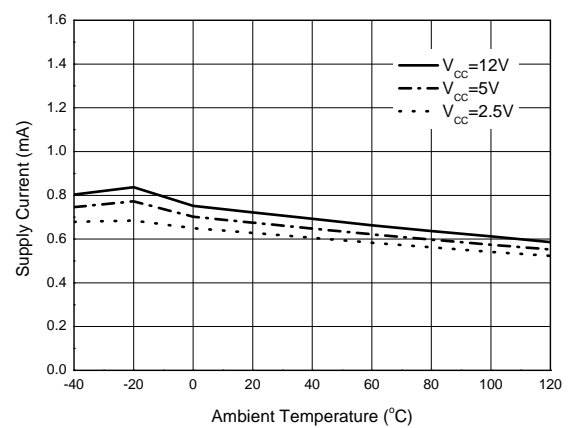
I_{BI} vs. Ambient Temperature



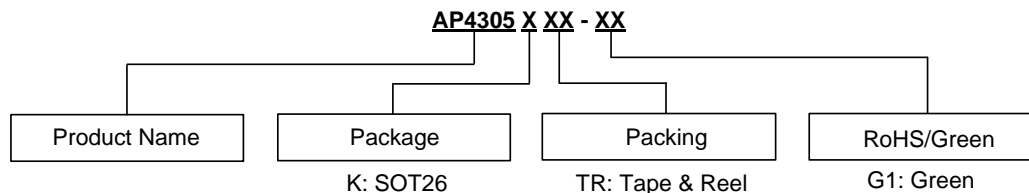
Output Short Circuit Current vs. Ambient Temperature



Supply Current vs. Ambient Temperature



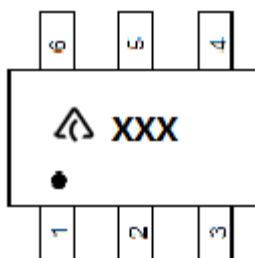
Ordering Information



| Package | Temperature Range | Part Number | Marking ID | Packing |
|---------|-------------------|--------------|------------|------------------|
| SOT26 | -40 to +105°C | AP4305KTR-G1 | G2B | 3000/Tape & Reel |

Marking Information

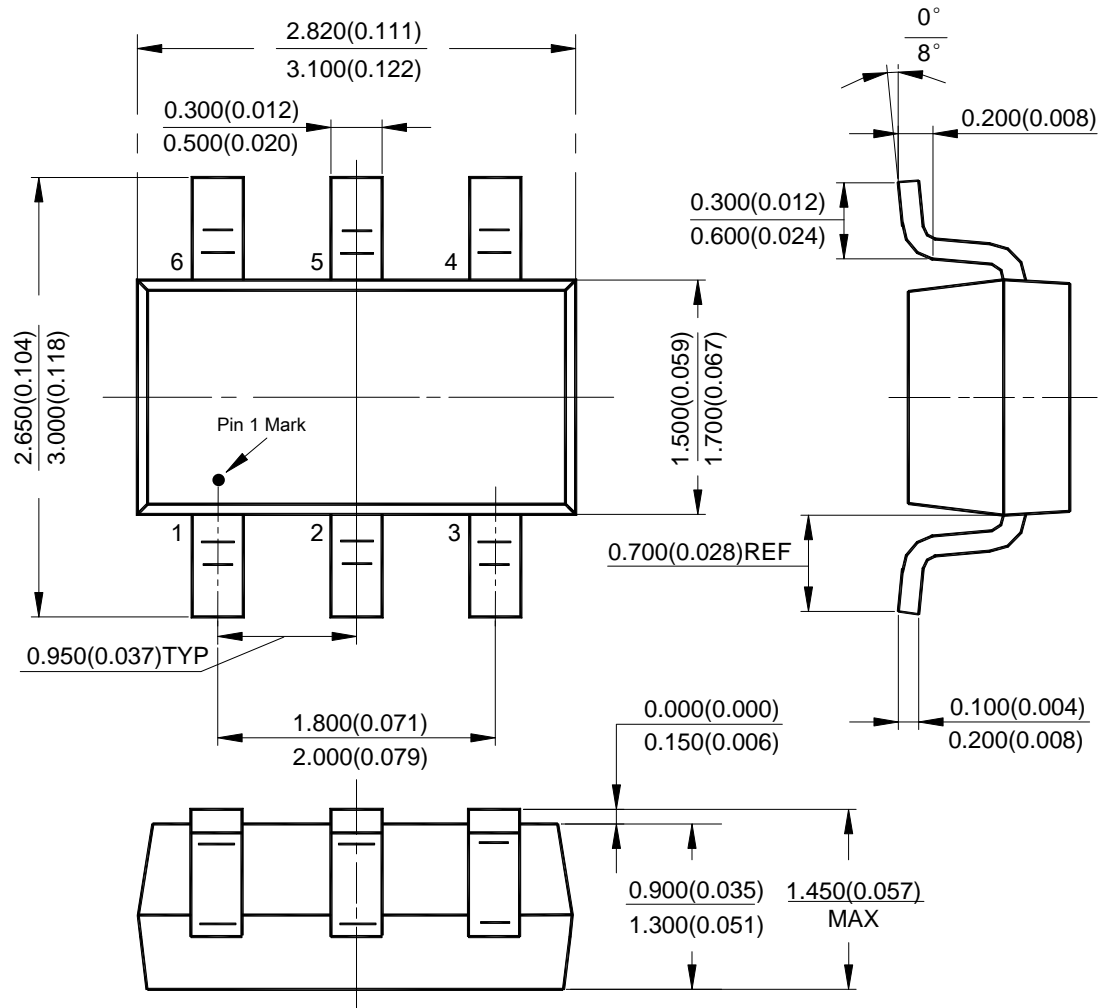
(Top View)



: Logo
XXX: Marking ID (See Ordering Information)

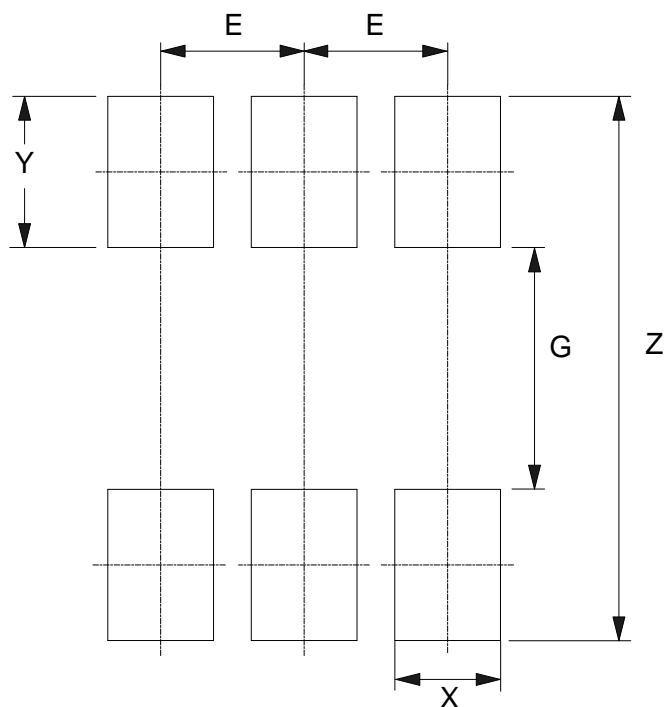
Package Outline Dimensions (All dimensions in mm(inch).)

(1) Package Type: SOT26



Suggested Pad Layout

(1) Package Type: SOT26



| Dimensions | Z (mm)/(inch) | G (mm)/(inch) | X (mm)/(inch) | Y (mm)/(inch) | E (mm)/(inch) |
|------------|------------------|------------------|------------------|------------------|------------------|
| Value | 3.600/0.142 | 1.600/0.063 | 0.700/0.028 | 1.000/0.039 | 0.950/0.037 |

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