

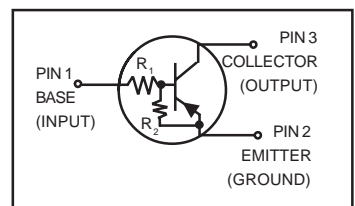
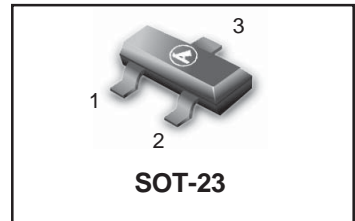
Bias Resistor Transistors

PNP Silicon Surface Mount Transistors with Monolithic Bias Resistor Network

This new series of digital transistors is designed to replace a single device and its external resistor bias network. The BRT (Bias Resistor Transistor) contains a single transistor with a monolithic bias network consisting of two resistors; a series base resistor and a base-emitter resistor. The BRT eliminates these individual components by integrating them into a single device. The use of a BRT can reduce both system cost and board space. The device is housed in the SOT-23 package which is designed for low power surface mount applications.

- Simplifies Circuit Design
- Reduces Board Space
- Reduces Component Count
- The SOT-23 package can be soldered using wave or reflow. The modified gull-winged leads absorb thermal stress during soldering eliminating the possibility of damage to the die.
- Available in 8 mm embossed tape and reel. Use the Device Number to order the 7 inch/3000 unit reel. Replace “T1” with “T3” in the Device Number to order the 13 inch/10,000 unit reel.
- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable

LMUN2110LT1G Series
S-LMUN2110LT1G Series



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|---------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 50 | Vdc |
| Collector-Emitter Voltage | V_{CEO} | 50 | Vdc |
| Collector Current | I_C | 100 | mAdc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|-----------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------|-------------------------------------|
| Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 246 (Note 1.) 400 (Note 2.) 1.5 (Note 1.) 2.0 (Note 2.) | mW $^\circ\text{C}/\text{W}$ |
| Thermal Resistance – Junction-to-Ambient | $R_{\theta JA}$ | 508 (Note 1.) 311 (Note 2.) | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance – Junction-to-Lead | $R_{\theta JL}$ | 174 (Note 1.) 208 (Note 2.) | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

1. FR-4 @ Minimum Pad
2. FR-4 @ 1.0 x 1.0 inch Pad

LMUN2110LT1G Series S-LMUN2110LT1G Series

DEVICE MARKING AND RESISTOR VALUES

| Device | Package | Marking | R1 (K) | R2 (K) | Shipping |
|----------------------------------------|---------|---------|--------|--------|----------------------------------------|
| LMUN2110LT1G (Note 3.) LMUN2110LT3G | SOT-23 | A6O | 47 | ∞ | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2111LT1G LMUN2111LT3G | SOT-23 | A6A | 10 | 10 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2112LT1G LMUN2112LT3G | SOT-23 | A6B | 22 | 22 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2113LT1G LMUN2113LT3G | SOT-23 | A6C | 47 | 47 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2114LT1G LMUN2114LT3G | SOT-23 | A6D | 10 | 47 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2115LT1G LMUN2115LT3G | SOT-23 | A6E | 10 | ∞ | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2116LT1G LMUN2116LT3G | SOT-23 | A6F | 4.7 | ∞ | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2130LT1G (Note 3.) LMUN2130LT3G | SOT-23 | A6G | 1.0 | 1.0 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2131LT1G LMUN2131LT3G | SOT-23 | A6H | 2.2 | 2.2 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2132LT1G LMUN2132LT3G | SOT-23 | A6J | 4.7 | 4.7 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2133LT1G LMUN2133LT3G | SOT-23 | A6K | 4.7 | 47 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2134LT1G (Note 3.) LMUN2134LT3G | SOT-23 | A6L | 22 | 47 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2136LT1G LMUN2136LT3G | SOT-23 | A6N | 100 | 100 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2137LT1G LMUN2137LT3G | SOT-23 | A6P | 47 | 22 | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2138LT1G (Note 3.) LMUN2138LT3G | SOT-23 | A6R | 2.2 | ∞ | 3000/Tape & Reel 10,000/Tape & Reel |
| LMUN2140LT1G (Note 3.) LMUN2140LT3G | SOT-23 | A6T | 47 | ∞ | 3000/Tape & Reel 10,000/Tape & Reel |

3. New devices. Updated curves to follow in subsequent data sheets.

LMUN2110LT1G Series S-LMUN2110LT1G Series

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|-------------------------------------------------------------------------------------|---------------|-----|-----|------|------|
| OFF CHARACTERISTICS | | | | | |
| Collector-Base Cutoff Current ($V_{CB} = 50\text{ V}, I_E = 0$) | I_{CBO} | – | – | 100 | nAdc |
| Collector-Emitter Cutoff Current ($V_{CE} = 50\text{ V}, I_B = 0$) | I_{CEO} | – | – | 500 | nAdc |
| Emitter-Base Cutoff Current ($V_{EB} = 6.0\text{ V}, I_C = 0$) | LMUN2110LT1G | – | – | 0.1 | mAdc |
| | LMUN2111LT1G | – | – | 0.5 | |
| | LMUN2112LT1G | – | – | 0.2 | |
| | LMUN2113LT1G | – | – | 0.1 | |
| | LMUN2114LT1G | – | – | 0.2 | |
| | LMUN2115LT1G | – | – | 0.9 | |
| | LMUN2116LT1G | – | – | 1.9 | |
| | LMUN2130LT1G | – | – | 4.3 | |
| | LMUN2131LT1G | – | – | 2.3 | |
| | LMUN2132LT1G | – | – | 1.5 | |
| | LMUN2133LT1G | – | – | 0.18 | |
| | LMUN2134LT1G | – | – | 0.13 | |
| | LMUN2136LT1G | – | – | 0.05 | |
| | LMUN2137LT1G | – | – | 0.13 | |
| LMUN2138LT1G | – | – | 4.0 | | |
| LMUN2140LT1G | – | – | 0.2 | | |
| Collector-Base Breakdown Voltage ($I_C = 10\ \mu\text{A}, I_E = 0$) | $V_{(BR)CBO}$ | 50 | – | – | Vdc |
| Collector-Emitter Breakdown Voltage (Note 4.) ($I_C = 2.0\text{ mA}, I_B = 0$) | $V_{(BR)CEO}$ | 50 | – | – | Vdc |

4. Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2.0%

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----|-----|------|------|
| ON CHARACTERISTICS (Note 5.) | | | | | |
| DC Current Gain ($V_{CE} = 10\text{ V}, I_C = 5.0\text{ mA}$) | LMUN2110LT1G | 80 | 140 | – | |
| | LMUN2111LT1G | 35 | 60 | – | |
| | LMUN2112LT1G | 60 | 100 | – | |
| | LMUN2113LT1G | 80 | 140 | – | |
| | LMUN2114LT1G | 80 | 140 | – | |
| | LMUN2115LT1G | 160 | 250 | – | |
| | LMUN2116LT1G | 160 | 250 | – | |
| | LMUN2130LT1G | 3.0 | 5.0 | – | |
| | LMUN2131LT1G | 8.0 | 15 | – | |
| | LMUN2132LT1G | 15 | 27 | – | |
| | LMUN2133LT1G | 80 | 140 | – | |
| | LMUN2134LT1G | 80 | 130 | – | |
| | LMUN2136LT1G | 80 | 150 | – | |
| | LMUN2137LT1G | 80 | 140 | – | |
| | LMUN2138LT1G | 160 | 350 | – | |
| LMUN2140LT1G | 120 | 250 | – | | |
| Collector-Emitter Saturation Voltage ($I_C = 10\text{ mA}, I_B = 0.3\text{ mA}$) ($I_C = 10\text{ mA}, I_B = 5\text{ mA}$) LMUN2130LT1G/LMUN2131LT1G ($I_C = 10\text{ mA}, I_B = 1\text{ mA}$) LMUN2115LT1G/LMUN2116LT1G/ LMUN2132LT1G/LMUN2133LT1G/ LMUN2134LT1G/LMUN2138LT1G/LMUN2140LT1G | $V_{CE(sat)}$ | – | – | 0.25 | Vdc |

LMUN2110LT1G Series S-LMUN2110LT1G Series
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

| Characteristic | Symbol | Min | Typ | Max | Unit | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|------|-------|------------|-----|
| ON CHARACTERISTICS (Note 5.) | | | | | | |
| Output Voltage (on) ($V_{CC} = 5.0\text{ V}$, $V_B = 2.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) | V_{OL} | – | – | 0.2 | Vdc | |
| LMUN2110LT1G | | – | – | 0.2 | | |
| LMUN2114LT1G | | – | – | 0.2 | | |
| LMUN2111LT1G | | – | – | 0.2 | | |
| LMUN2112LT1G | | – | – | 0.2 | | |
| LMUN2114LT1G | | – | – | 0.2 | | |
| LMUN2115LT1G | | – | – | 0.2 | | |
| LMUN2116LT1G | | – | – | 0.2 | | |
| LMUN2130LT1G | | – | – | 0.2 | | |
| LMUN2131LT1G | | – | – | 0.2 | | |
| LMUN2132LT1G | | – | – | 0.2 | | |
| LMUN2133LT1G | | – | – | 0.2 | | |
| LMUN2134LT1G | | – | – | 0.2 | | |
| LMUN2138LT1G | | – | – | 0.2 | | |
| ($V_{CC} = 5.0\text{ V}$, $V_B = 3.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) | | LMUN2113LT1G | – | – | | 0.2 |
| LMUN2140LT1G | | – | – | 0.2 | | |
| ($V_{CC} = 5.0\text{ V}$, $V_B = 5.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) | LMUN2136LT1G | – | – | 0.2 | | |
| ($V_{CC} = 5.0\text{ V}$, $V_B = 4.0\text{ V}$, $R_L = 1.0\text{ k}\Omega$) | LMUN2137LT1G | – | – | 0.2 | | |
| Output Voltage (off) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.5\text{ V}$, $R_L = 1.0\text{ k}\Omega$) ($V_{CC} = 5.0\text{ V}$, $V_B = 0.25\text{ V}$, $R_L = 1.0\text{ k}\Omega$) | V_{OH} | 4.9 | – | – | Vdc | |
| LMUN2115LT1G | | | | | | |
| LMUN2116LT1G | | | | | | |
| LMUN2131LT1G | | | | | | |
| LMUN2132LT1G | | | | | | |
| LMUN2138LT1G | | | | | | |
| ($V_{CC} = 5.0\text{ V}$, $V_B = 0.050\text{ V}$, $R_L = 1.0\text{ k}\Omega$) | LMUN2140LT1G | | | | | |
| LMUN2130LT1G | | | | | | |
| Input Resistor | R_1 | 32.9 | 47 | 61.1 | k Ω | |
| LMUN2110LT1G | | 7.0 | 10 | 13 | | |
| LMUN2111LT1G | | 15.4 | 22 | 28.6 | | |
| LMUN2112LT1G | | 32.9 | 47 | 61.1 | | |
| LMUN2114LT1G | | 7.0 | 10 | 13 | | |
| LMUN2115LT1G | | 7.0 | 10 | 13 | | |
| LMUN2116LT1G | | 3.3 | 4.7 | 6.1 | | |
| LMUN2130LT1G | | 0.7 | 1.0 | 1.3 | | |
| LMUN2131LT1G | | 1.5 | 2.2 | 2.9 | | |
| LMUN2132LT1G | | 3.3 | 4.7 | 6.1 | | |
| LMUN2133LT1G | | 3.3 | 4.7 | 6.1 | | |
| LMUN2134LT1G | | 15.4 | 22 | 28.6 | | |
| LMUN2136LT1G | | 70 | 100 | 130 | | |
| LMUN2137LT1G | | 32.9 | 47 | 61.1 | | |
| LMUN2138LT1G | | 1.54 | 2.2 | 2.86 | | |
| LMUN2140LT1G | | 32.9 | 47 | 61.1 | | |
| Resistor Ratio | | R_1/R_2 | 0.8 | 1.0 | | 1.2 |
| LMUN2111LT1G/LMUN2112LT1G/ LMUN2113LT1G/LMUN2136LT1G/ LMUN2130LT1G/LMUN2131LT1G/ LMUN2132LT1G LMUN2114LT1G | 0.17 | | 0.21 | 0.25 | | |
| LMUN2115LT1G/LMUN2116LT1G/ LMUN2110LT1G/LMUN2138LT1G/LMUN2140LT1G | – | | – | – | | |
| LMUN2133LT1G | 0.055 | | 0.1 | 0.185 | | |
| LMUN2137LT1G | 1.7 | | 2.1 | 2.6 | | |

 5. Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2.0%

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2111LT1G

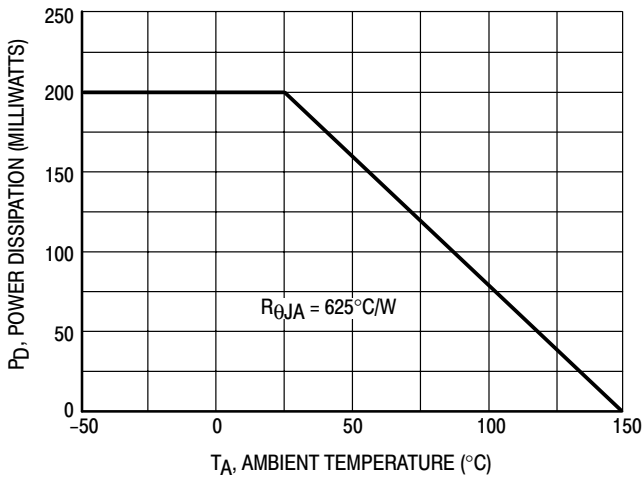


Figure 1. Derating Curve

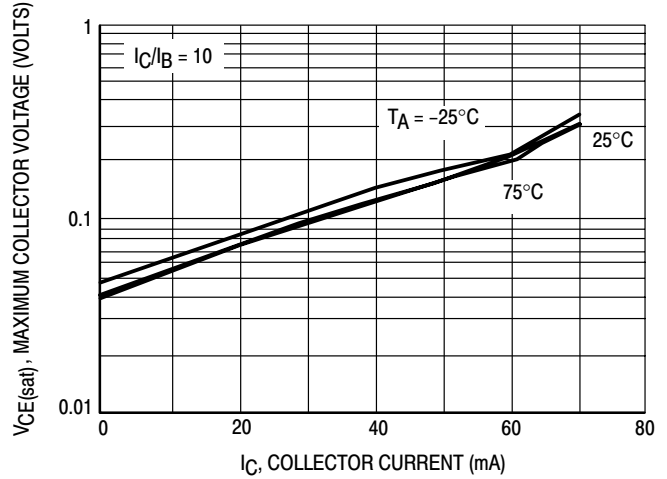


Figure 2. $V_{CE(sat)}$ versus I_C

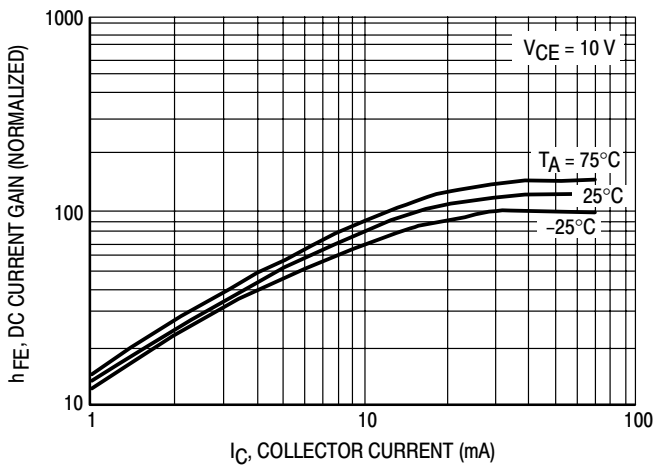


Figure 3. DC Current Gain

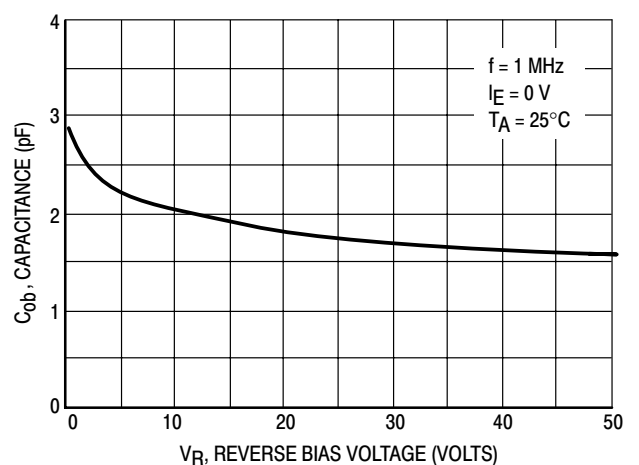


Figure 4. Output Capacitance

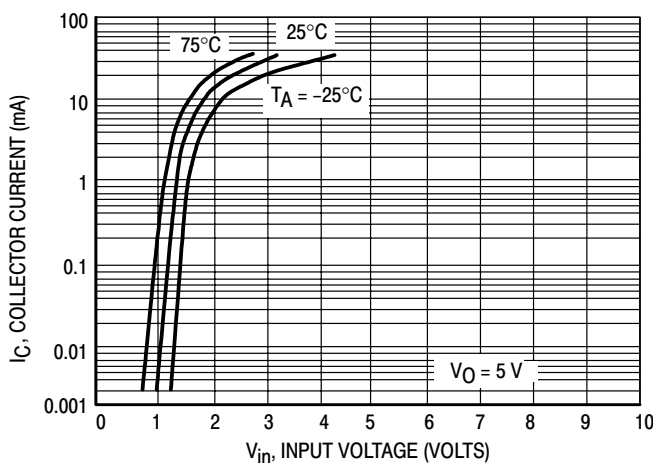


Figure 5. Output Current versus Input Voltage

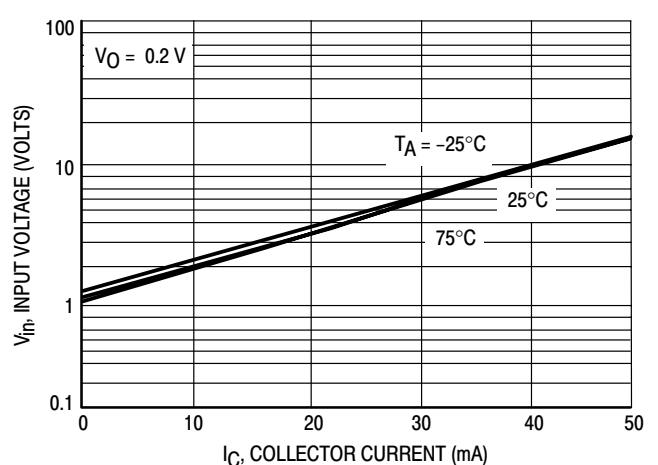


Figure 6. Input Voltage versus Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2112LT1G

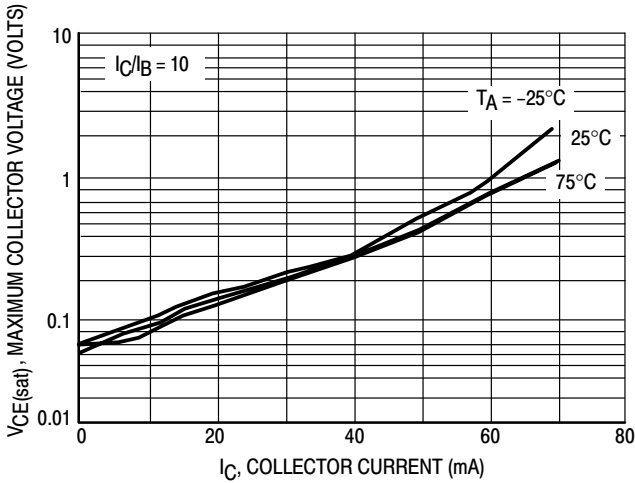


Figure 7. $V_{CE(sat)}$ versus I_C

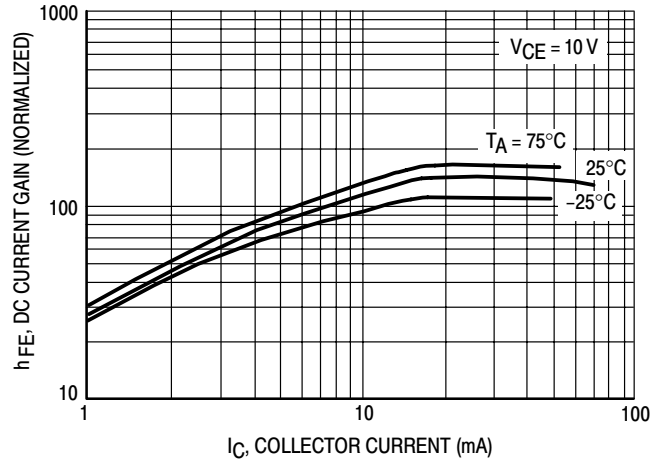


Figure 8. DC Current Gain

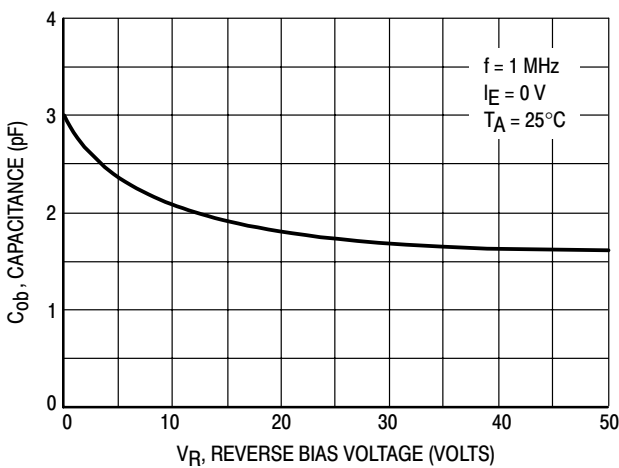


Figure 9. Output Capacitance

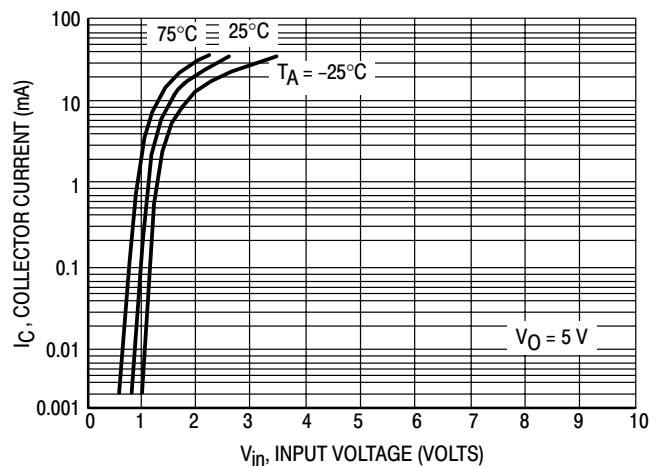


Figure 10. Output Current versus Input Voltage

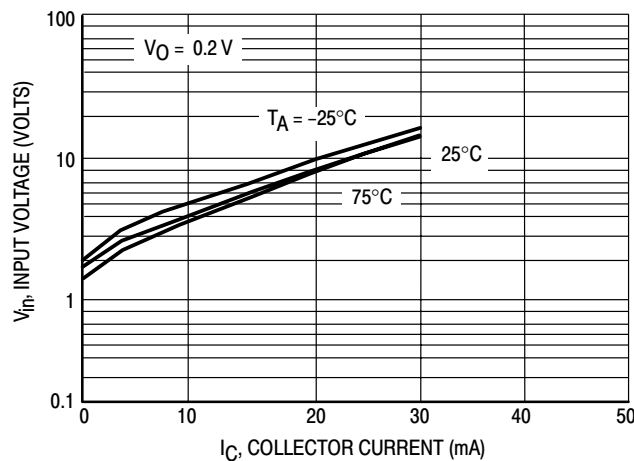


Figure 11. Input Voltage versus Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2113LT1G

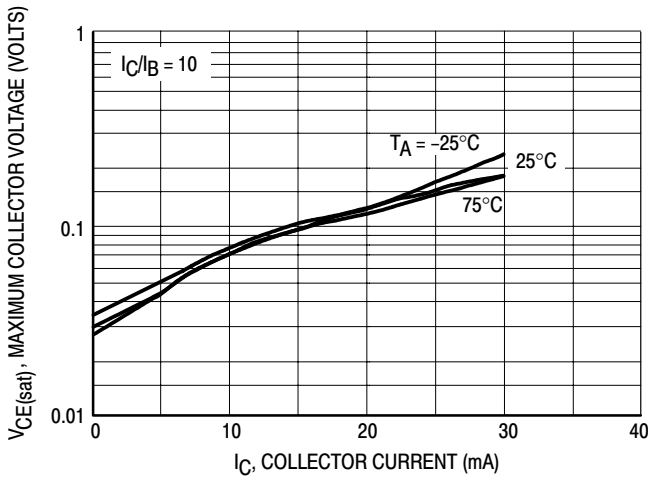


Figure 12. $V_{CE(sat)}$ versus I_C

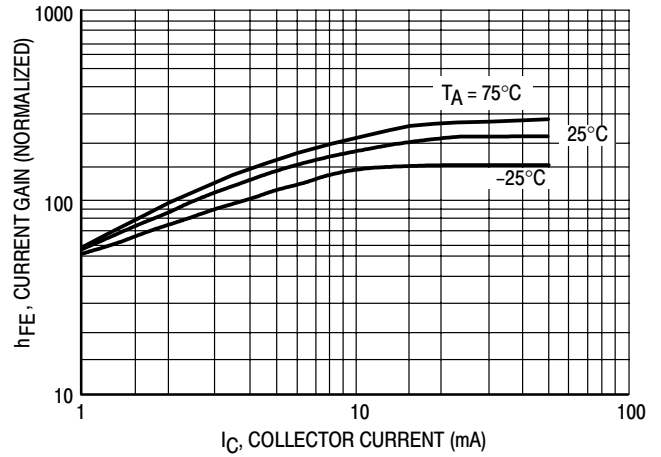


Figure 13. DC Current Gain

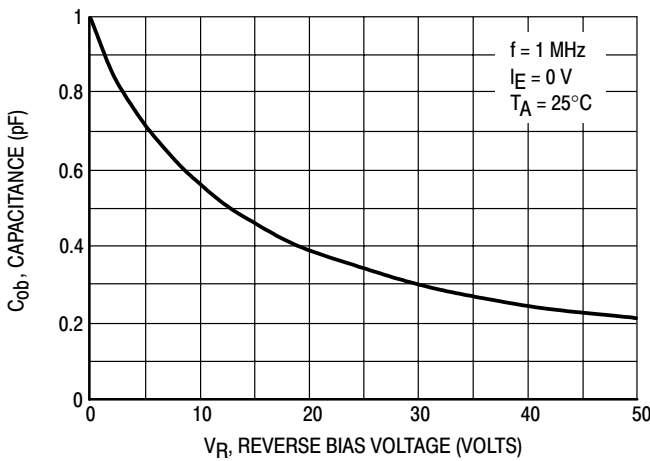


Figure 14. Output Capacitance

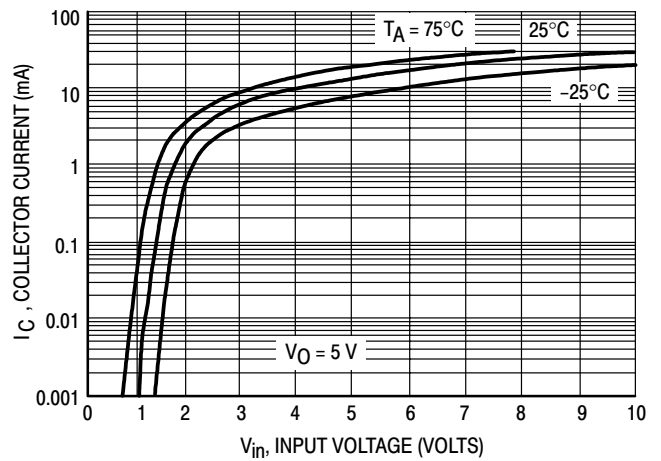


Figure 15. Output Current versus Input Voltage

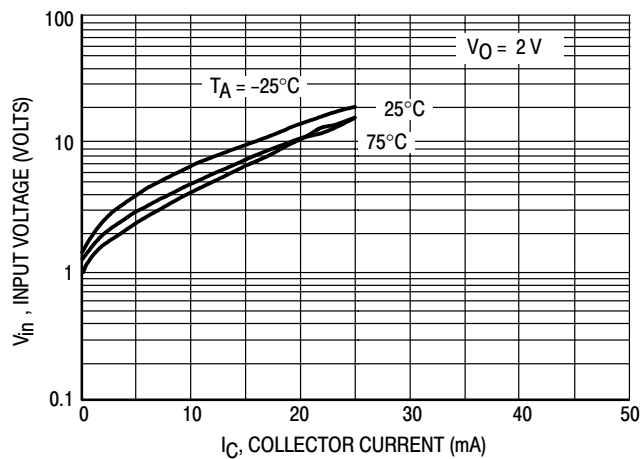


Figure 16. Input Voltage versus Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2114LT1G

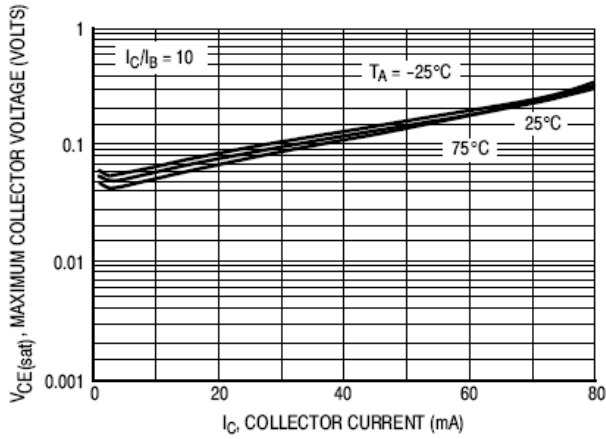


Figure 17. $V_{CE(sat)}$ versus I_C

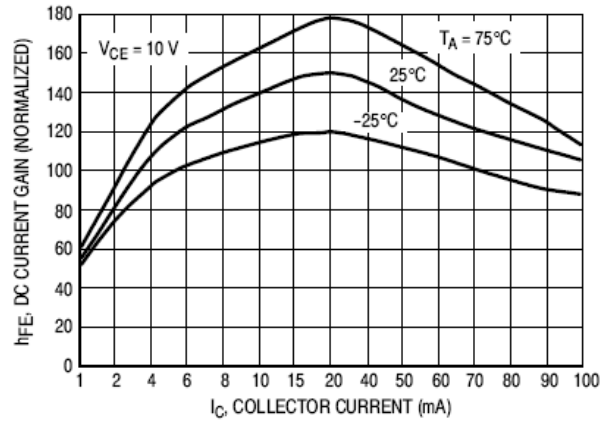


Figure 18. DC Current Gain

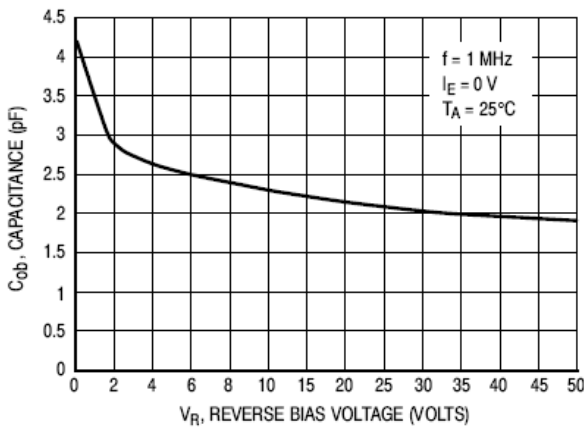


Figure 19. Output Capacitance

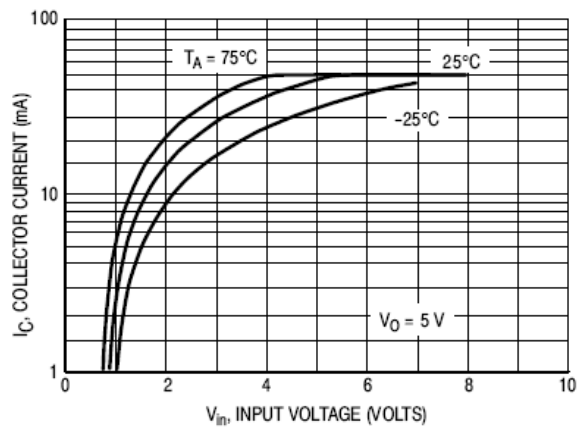


Figure 20. Output Current versus Input Voltage

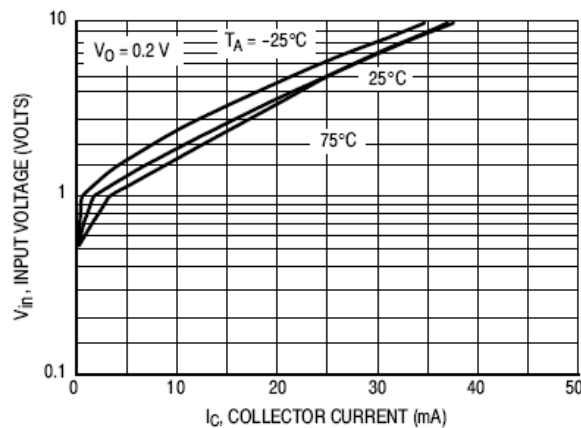


Figure 21. Input Voltage versus Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2115LT1G

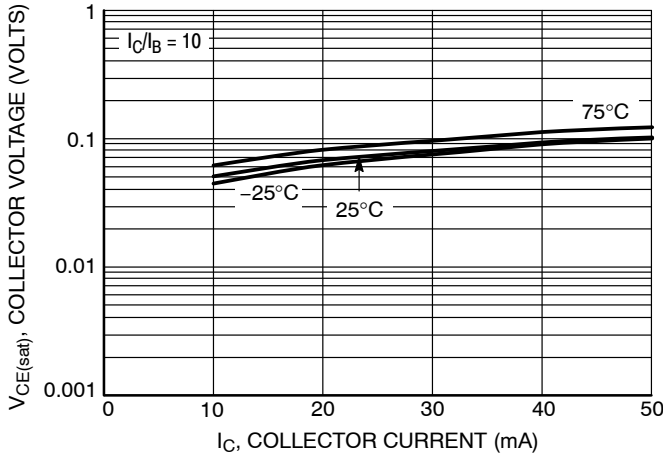


Figure 22. $V_{CE(sat)}$ versus I_C

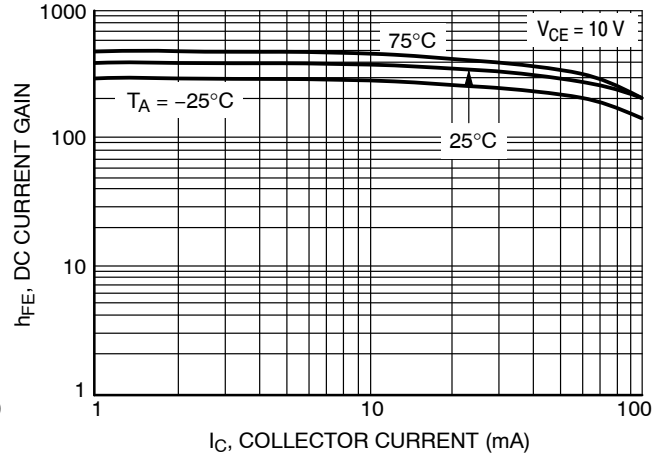


Figure 23. DC Current Gain

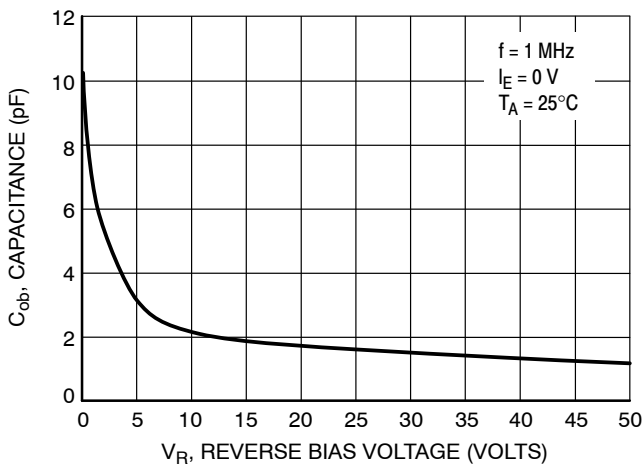


Figure 24. Output Capacitance

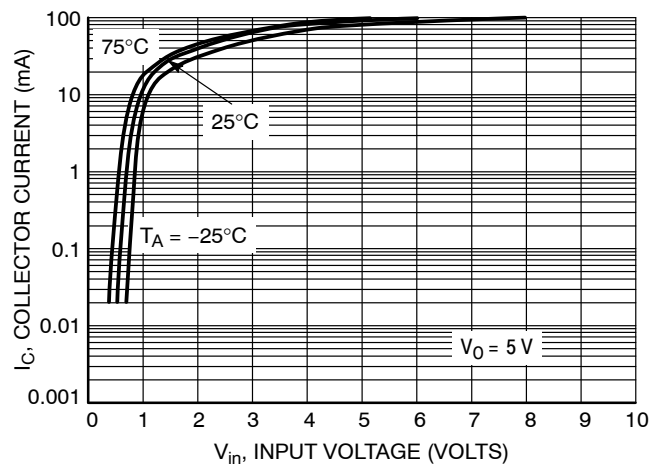


Figure 25. Output Current versus Input Voltage

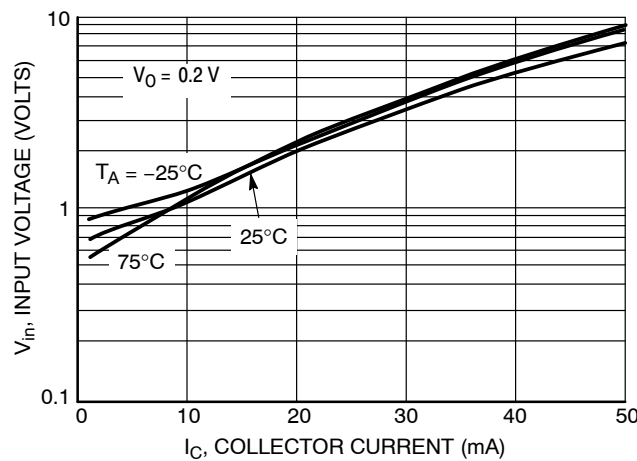


Figure 26. Input Voltage versus Output Current

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2116LT1G

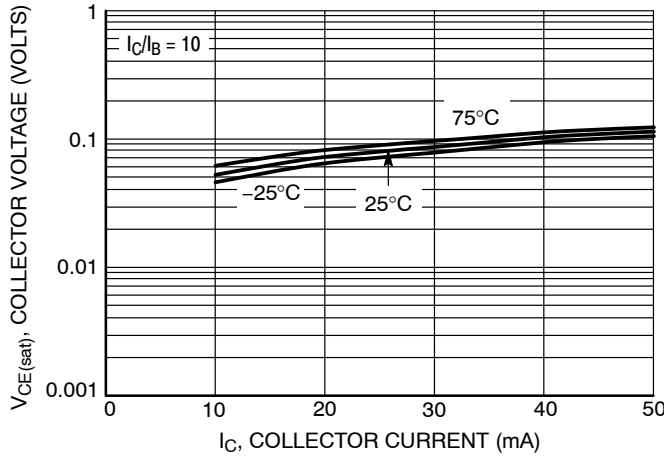


Figure 27. $V_{CE(sat)}$ versus I_C

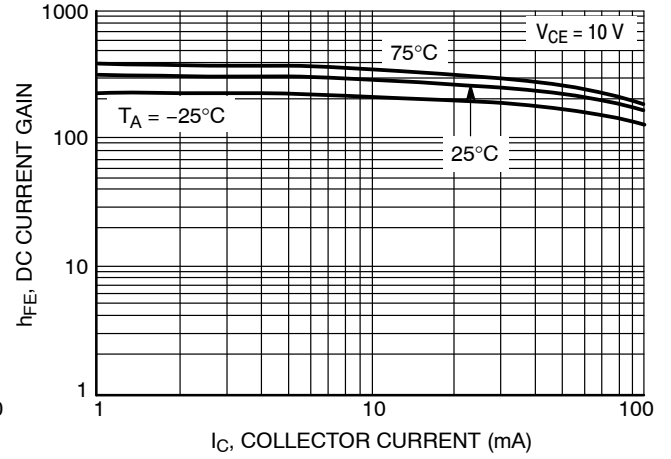


Figure 28. DC Current Gain

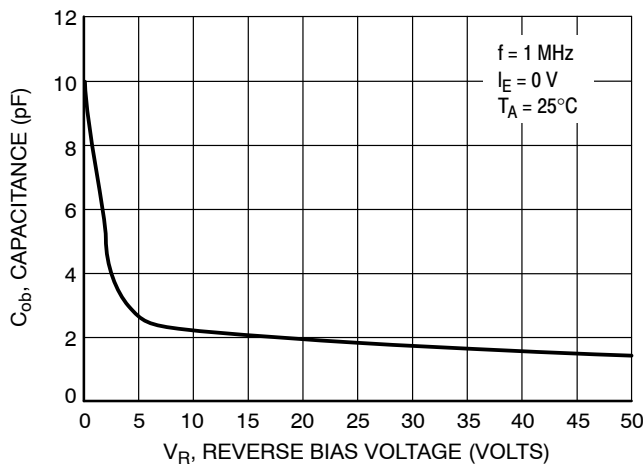


Figure 29. Output Capacitance

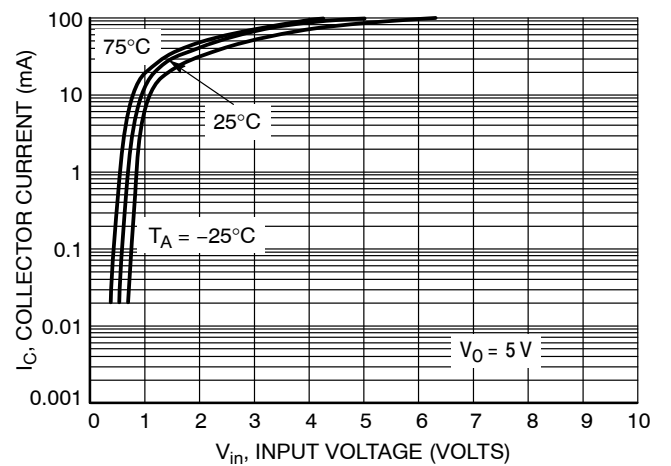


Figure 30. Output Current versus Input Voltage

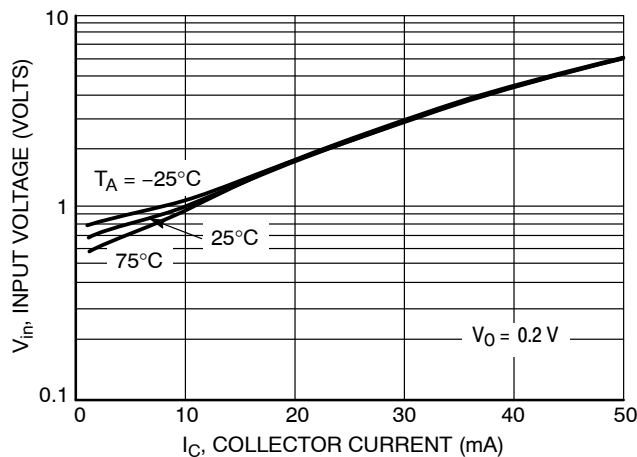


Figure 31. Input Voltage versus Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2131LT1G

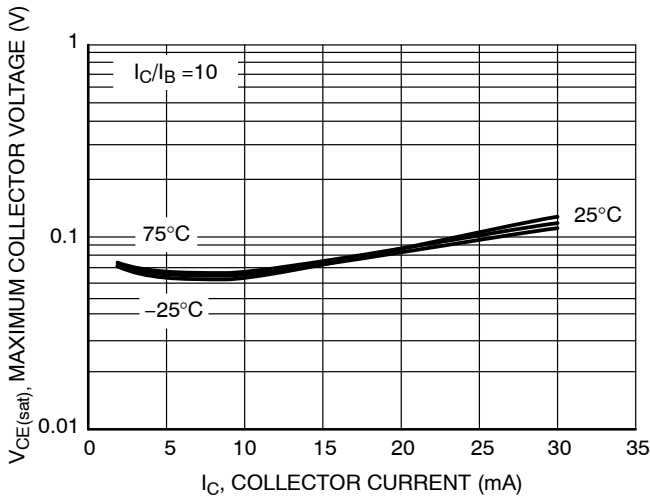


Figure 32. $V_{CE(sat)}$ vs. I_C

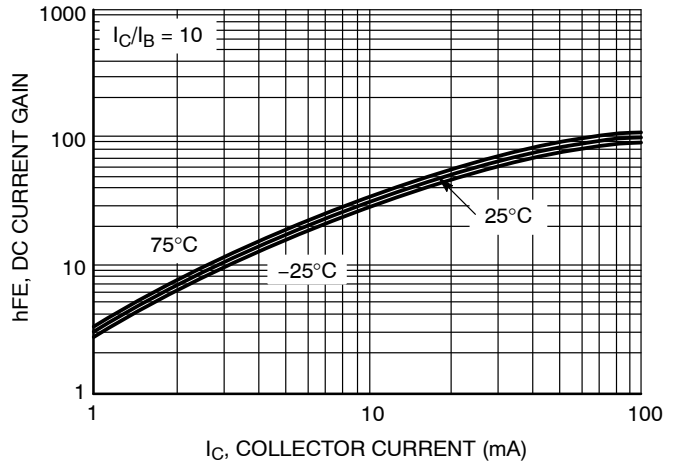


Figure 33. DC Current Gain

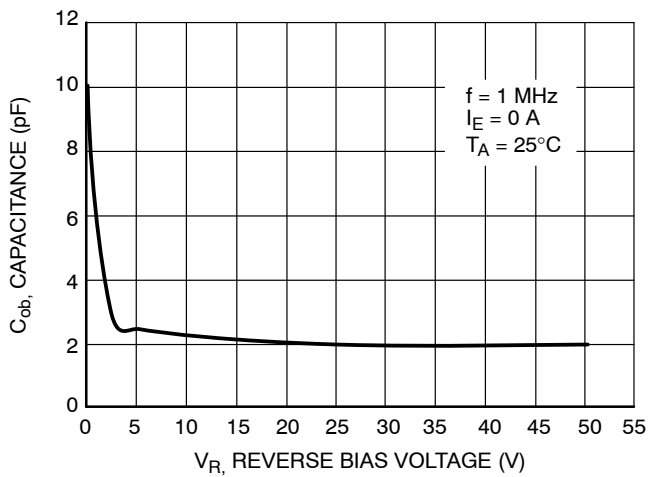


Figure 34. Output Capacitance

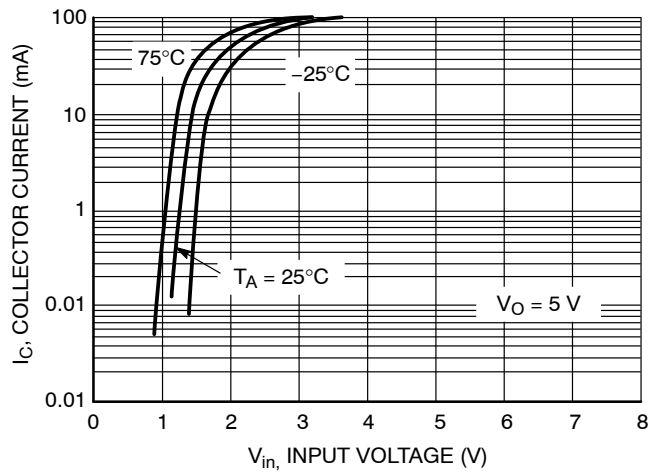


Figure 35. Output Current vs. Input Voltage

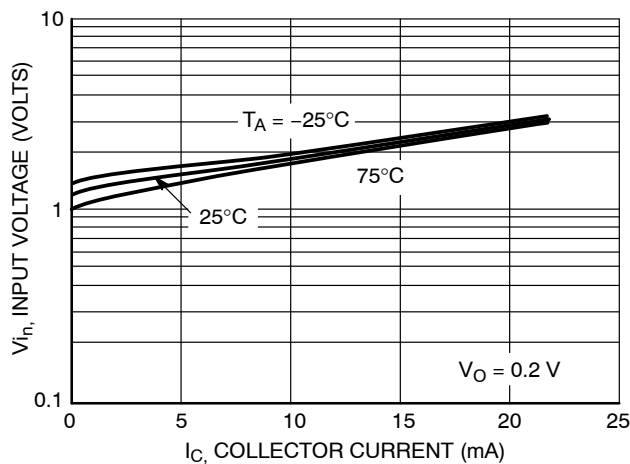


Figure 36. Input Voltage vs. Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2132LT1G

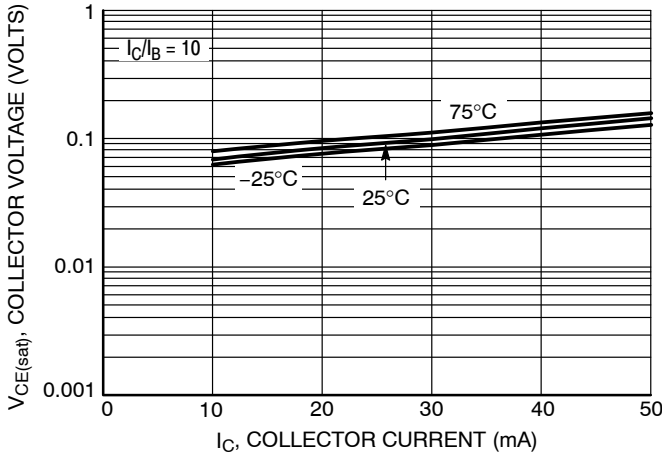


Figure 37. $V_{CE(sat)}$ versus I_C

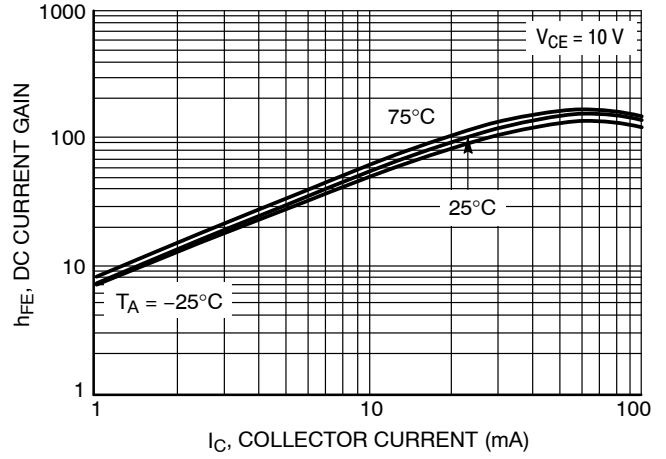


Figure 38. DC Current Gain

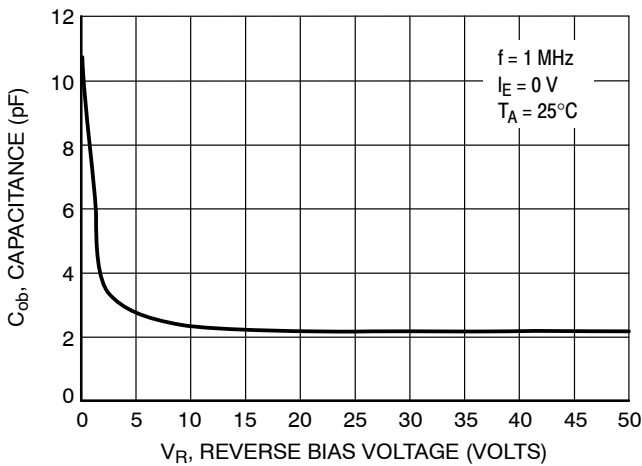


Figure 39. Output Capacitance

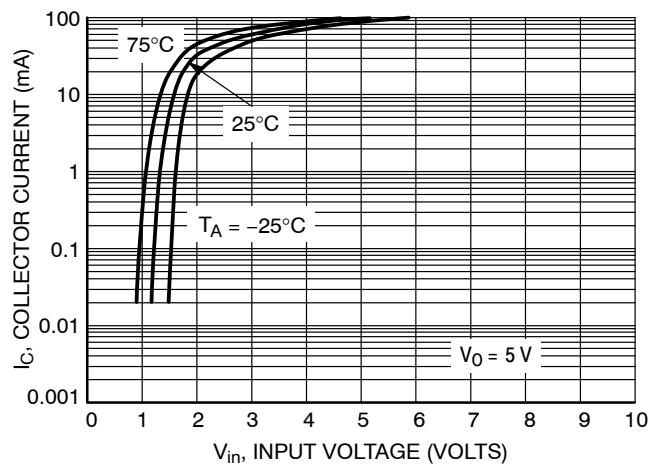


Figure 40. Output Current versus Input Voltage

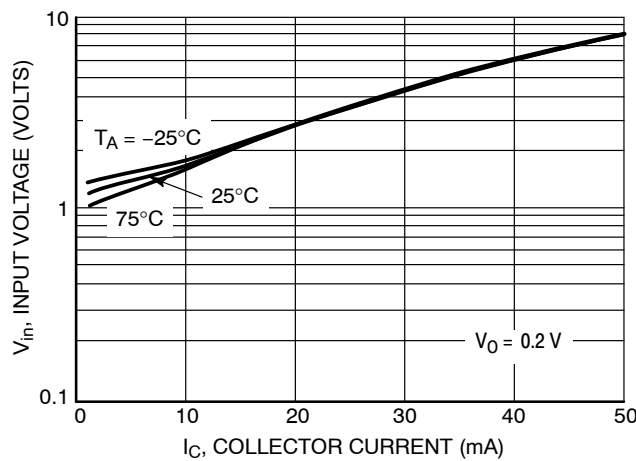


Figure 41. Input Voltage versus Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2133LT1G

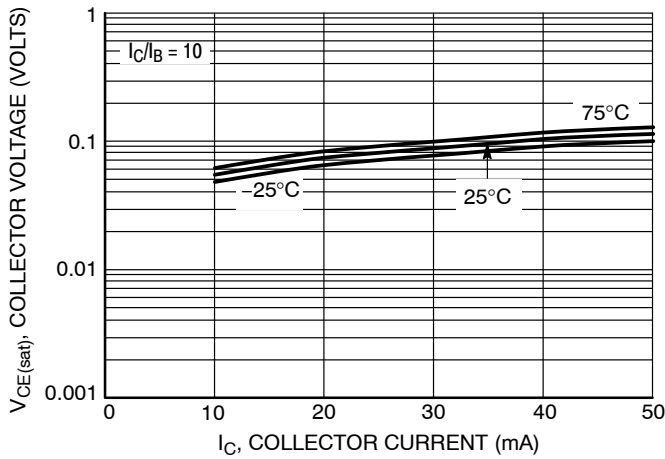


Figure 42. $V_{CE(sat)}$ versus I_C

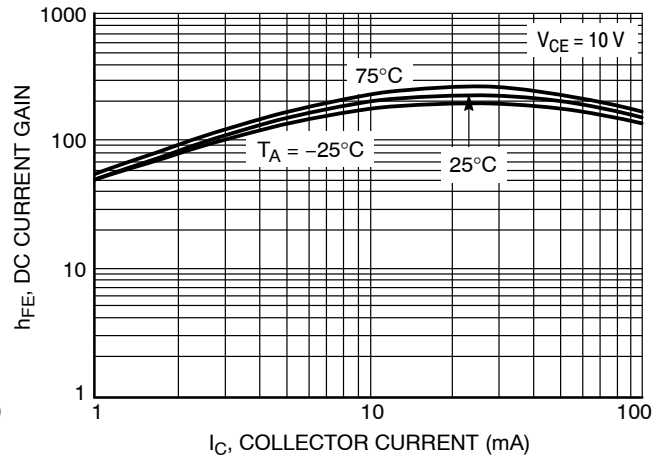


Figure 43. DC Current Gain

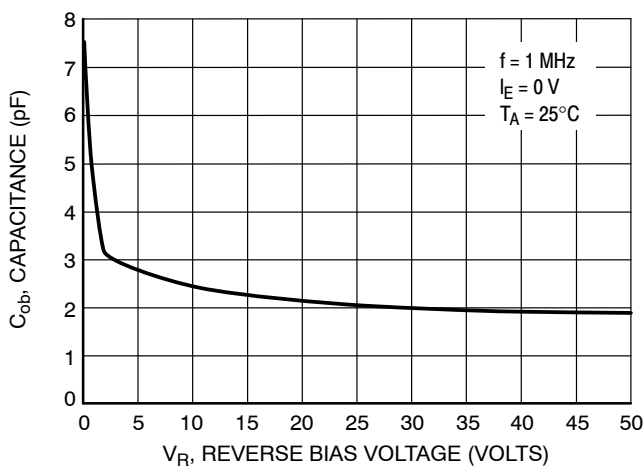


Figure 44. Output Capacitance

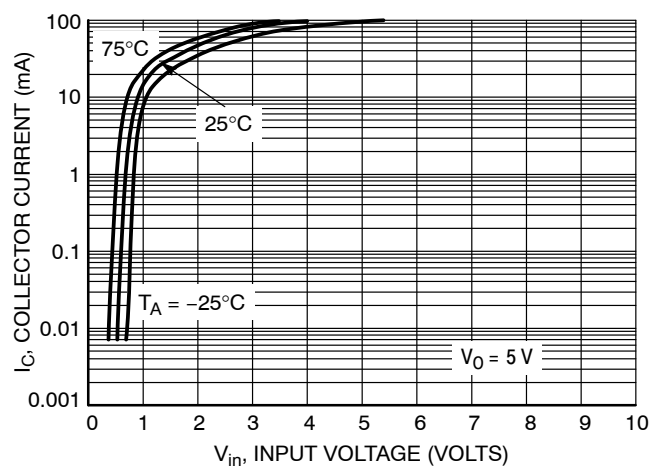


Figure 45. Output Current versus Input Voltage

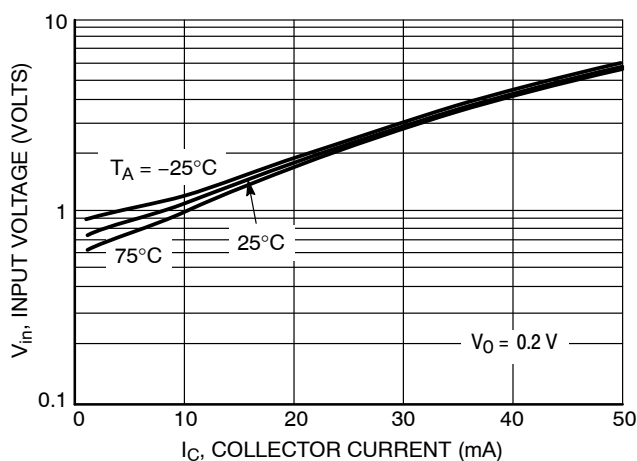


Figure 46. Input Voltage versus Output Current

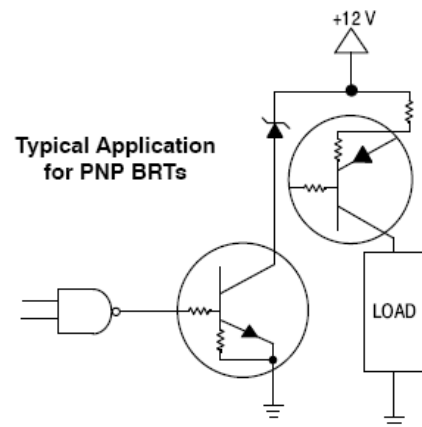


Figure 47. Inexpensive, Unregulated Current Source

LMUN2110LT1G Series S-LMUN2110LT1G Series
 TYPICAL ELECTRICAL CHARACTERISTICS
 LMUN2136LT1G

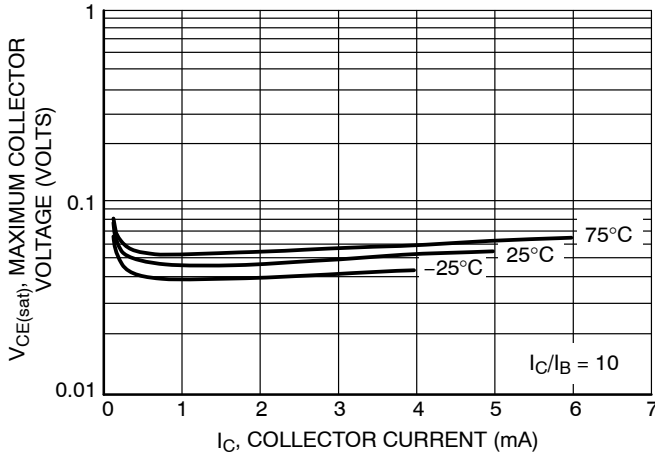


Figure 48. Maximum Collector Voltage vs. Collector Current

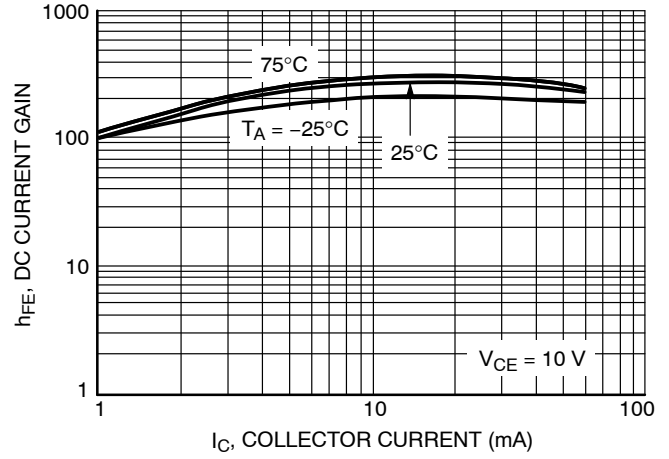


Figure 49. DC Current Gain

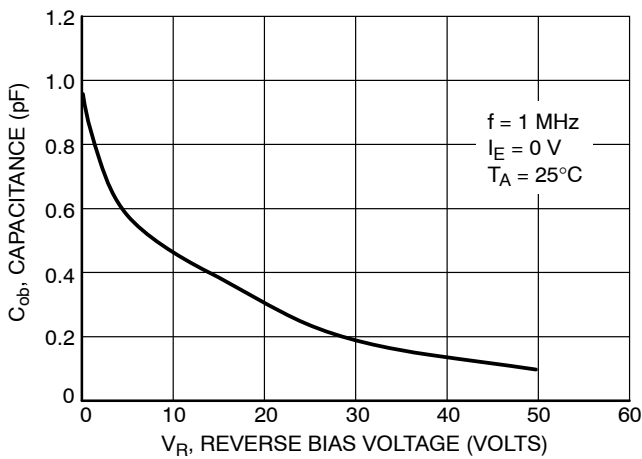


Figure 50. Output Capacitance

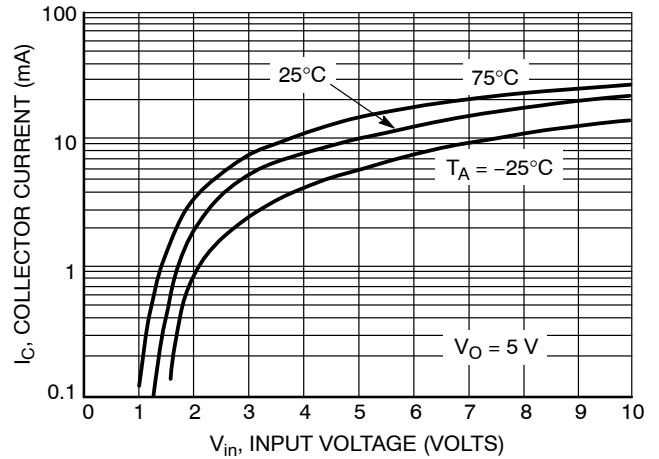


Figure 51. Output Current vs. Input Voltage

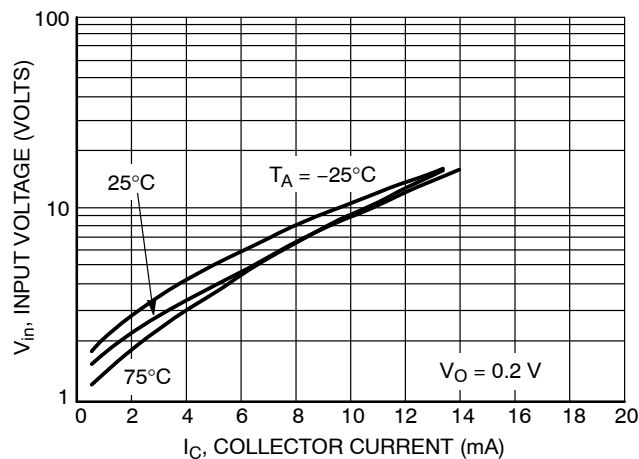


Figure 52. Input Voltage vs. Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

TYPICAL ELECTRICAL CHARACTERISTICS
LMUN2137LT1G

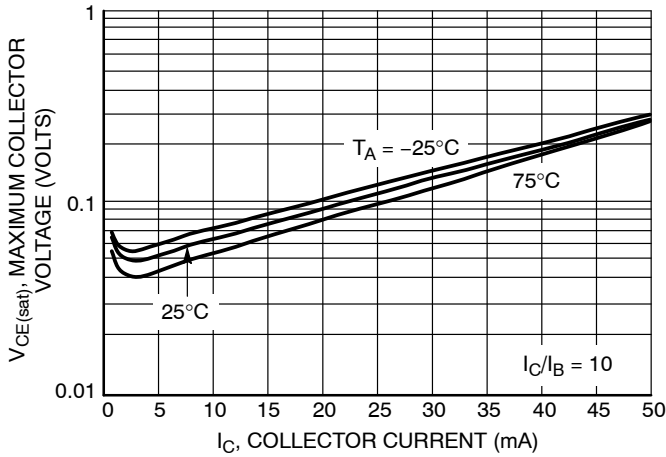


Figure 53. Maximum Collector Voltage vs. Collector Current

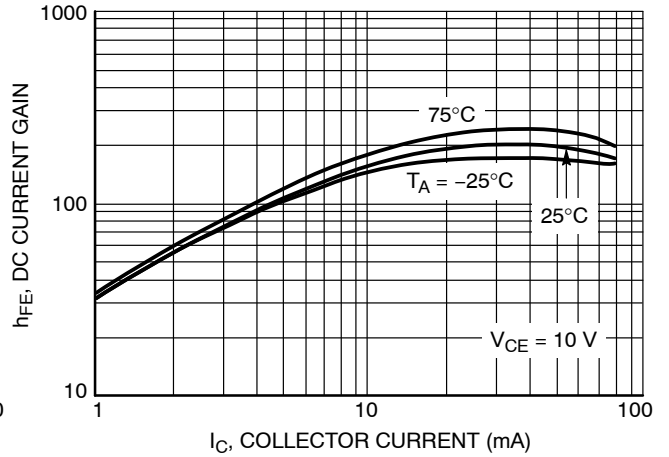


Figure 54. DC Current Gain

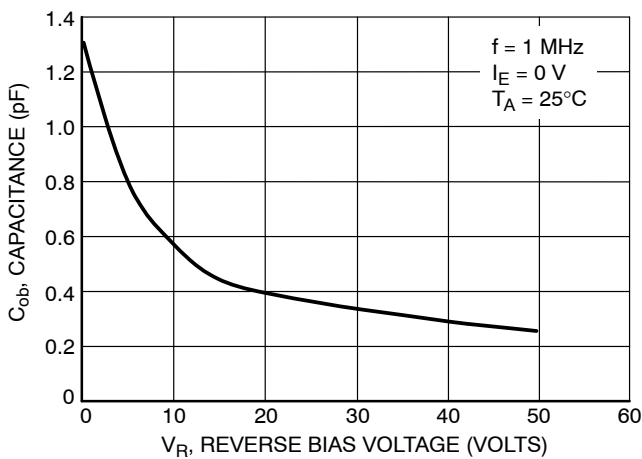


Figure 55. Output Capacitance

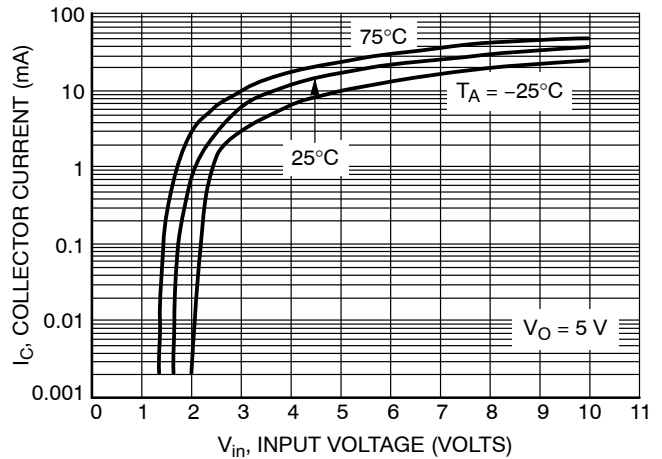


Figure 56. Output Current vs. Input Voltage

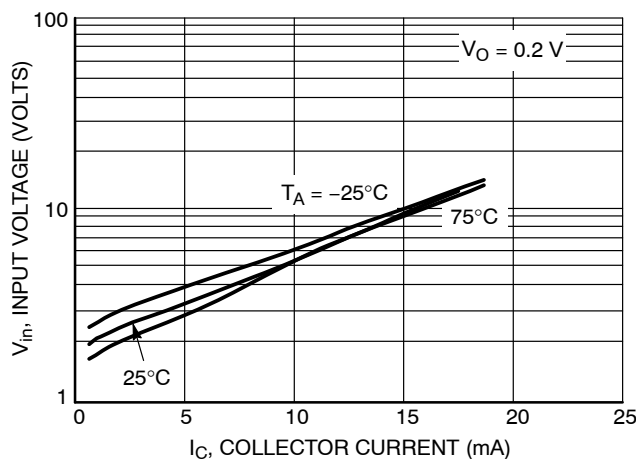
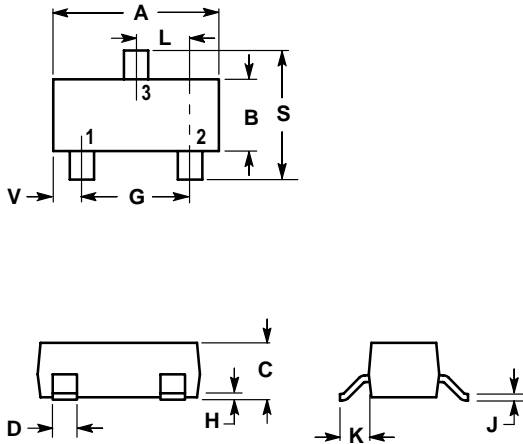


Figure 57. Input Voltage vs. Output Current

LMUN2110LT1G Series S-LMUN2110LT1G Series

SOT-23

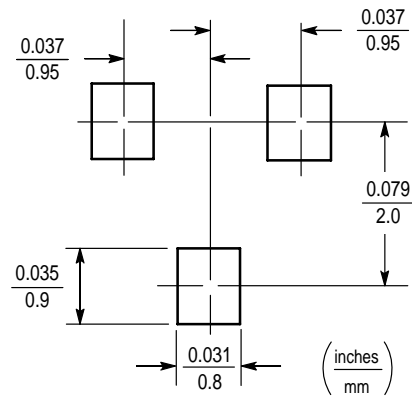


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|--------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.1102 | 0.1197 | 2.80 | 3.04 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 |
| C | 0.0350 | 0.0440 | 0.89 | 1.11 |
| D | 0.0150 | 0.0200 | 0.37 | 0.50 |
| G | 0.0701 | 0.0807 | 1.78 | 2.04 |
| H | 0.0005 | 0.0040 | 0.013 | 0.100 |
| J | 0.0034 | 0.0070 | 0.085 | 0.177 |
| K | 0.0140 | 0.0285 | 0.35 | 0.69 |
| L | 0.0350 | 0.0401 | 0.89 | 1.02 |
| S | 0.0830 | 0.1039 | 2.10 | 2.64 |
| V | 0.0177 | 0.0236 | 0.45 | 0.60 |

- PIN 1. BASE
 2. EMITTER
 3. COLLECTOR



单击下面可查看定价，库存，交付和生命周期等信息

[>>LRC\(乐山无线电\)](#)