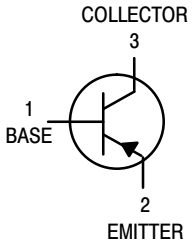
# General Purpose Transistor

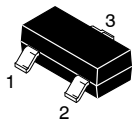
## PNP Silicon

# MMBT4126LT1G




### Features

- Moisture Sensitivity Level: 1
- ESD Rating: – Human Body Model: > 4000 V
  – Machine Model: > 400 V
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant




**SOT–23**
**CASE 318**
**STYLE 6**

### MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector–Emitter Voltage | $V_{CEO}$ | –25 | Vdc |
| Collector–Base Voltage | $V_{CBO}$ | –25 | Vdc |
| Emitter–Base Voltage | $V_{EBO}$ | –4 | Vdc |
| Collector Current–Continuous | $I_C$ | –200 | mAdc |

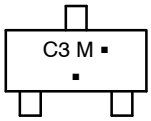
### THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Total Device Dissipation FR–5 Board (Note 1) @$T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 225<br>1.8 | mW<br>mW/°C |
| Thermal Resistance, Junction–to–Ambient (Note 1) | $R_{\theta JA}$ | 556 | °C/W |
| Total Device Dissipation Alumina Substrate, (Note 2) @$T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 300<br>2.4 | mW<br>mW/°C |
| Thermal Resistance, Junction–to–Ambient (Note 2) | $R_{\theta JA}$ | 417 | °C/W |
| Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | –55 to +150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR–5 = 1.0 × 0.75 × 0.062 in.
2. Alumina = 0.4 × 0.3 × 0.024 in. 99.5% alumina.

### MARKING DIAGRAM




C3 = Device Code
M = Date Code*
▪ = Pb–Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| MMBT4126LT1G | SOT–23 (Pb–Free) | 3000/Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Collector−Emitter Breakdown Voltage (Note 3) ($I_C$ = −1.0 mAdc, $I_B$ = 0) | $V_{(BR)CEO}$ | −25 | – | Vdc |
| Collector−Base Breakdown Voltage ($I_C$ = −10 μAdc, $I_E$ = 0) | $V_{(BR)CBO}$ | −25 | – | Vdc |
| Emitter−Base Breakdown Voltage ($I_E$ = −10 μAdc, $I_C$ = 0) | $V_{(BR)EBO}$ | −4 | – | Vdc |
| Collector Cutoff Current ($V_{CE}$ = −30 Vdc, $V_{EB}$ = −3.0 Vdc) | $I_{CEX}$ | – | −50 | nAdc |
| **ON CHARACTERISTICS** (Note 3) | | | | |
| DC Current Gain ($I_C$ = −2.0 mAdc, $V_{CE}$ = −1.0 Vdc)<br>($I_C$ = −50 mAdc, $V_{CE}$ = −1.0 Vdc) | $H_{FE}$ | 120<br>60 | 300<br>– | – |
| Collector−Emitter Saturation Voltage ($I_C$ = −50 mAdc, $I_B$ = −5.0 mAdc) | $V_{CE(sat)}$ | – | −0.4 | Vdc |
| Base−Emitter Saturation Voltage ($I_C$ = −50 mAdc, $I_B$ = −5.0 mAdc) | $V_{BE(sat)}$ | – | −0.95 | Vdc |
| **SMALL−SIGNAL CHARACTERISTICS** | | | | |
| Current−Gain − Bandwidth Product ($I_C$ = −10 mAdc, $V_{CE}$ = −20 Vdc, f = 100 MHz) | $f_T$ | 250 | – | MHz |
| Output Capacitance ($V_{CB}$ = −5.0 Vdc, $I_E$ = 0, f = 1.0 MHz) | $C_{obo}$ | – | 4.5 | pF |
| Input Capacitance ($V_{EB}$ = −0.5 Vdc, $I_C$ = 0, f = 1.0 MHz) | $C_{ibo}$ | – | 10 | pF |
| Small−Signal Current Gain ($I_C$ = −2.0 mAdc, $V_{CE}$ = −10 Vdc, f = 1.0 kHz)<br>($I_C$ = 10 mAdc, $V_{CE}$ = 20 Vdc, f = 100 MHz) | $h_{fe}$ | 120<br>2.5 | 480<br>– | – |
| Noise Figure ($I_C$ = −100 μAdc, $V_{CE}$ = −5.0 Vdc, $R_S$ = 1.0 kΩ, f = 1.0 kHz) | NF | – | 4.0 | dB |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

## TYPICAL TRANSIENT CHARACTERISTICS

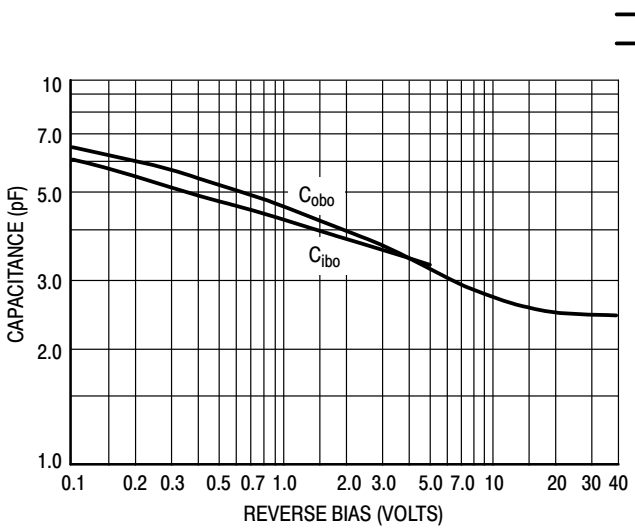


**Figure 1. Capacitance**

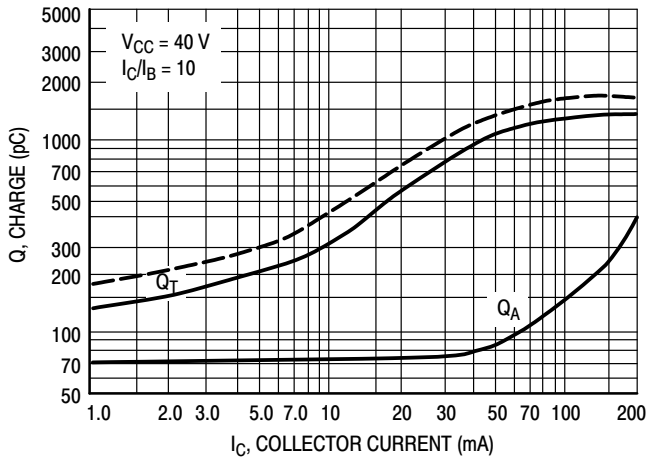


**Figure 2. Charge Data**



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## TYPICAL AUDIO SMALL–SIGNAL CHARACTERISTICS
## NOISE FIGURE VARIATIONS

($V_{CE}$ = –5.0 Vdc, $T_A$ = 25°C, Bandwidth = 1.0 Hz)

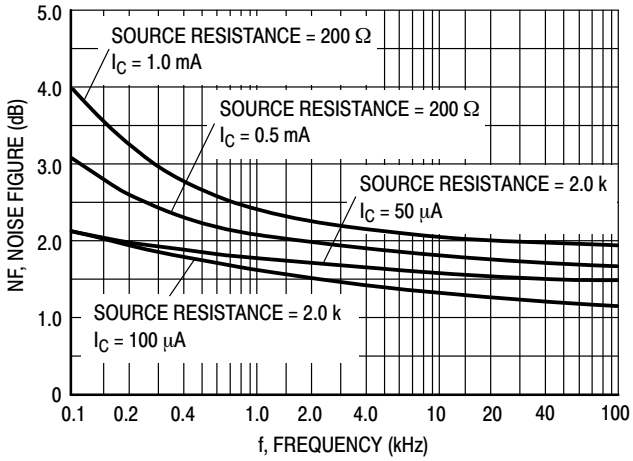


**Figure 3.**

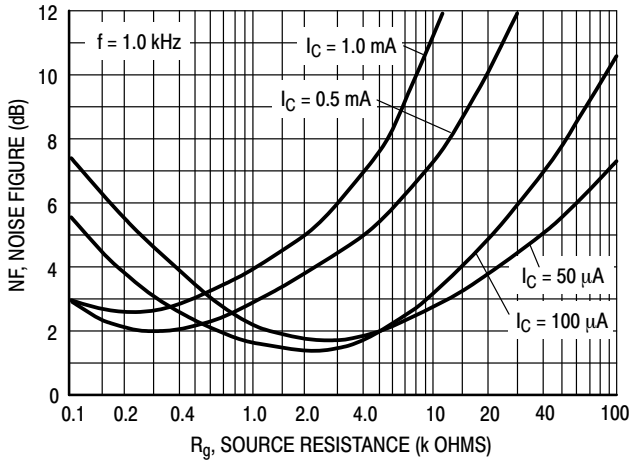


**Figure 4.**

## h PARAMETERS

($V_{CE}$ = –10 Vdc, f = 1.0 kHz, $T_A$ = 25°C)

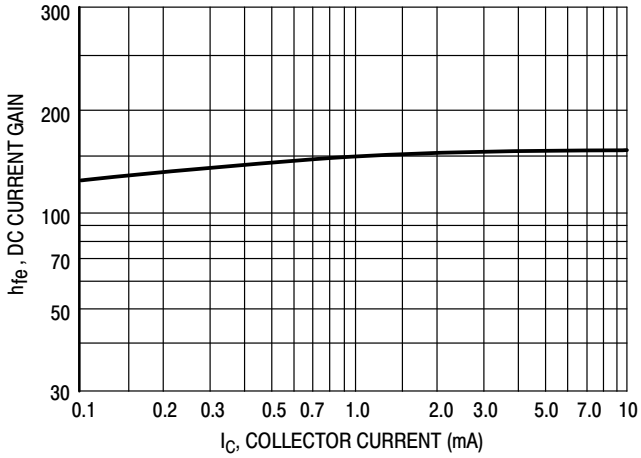


**Figure 5. Current Gain**

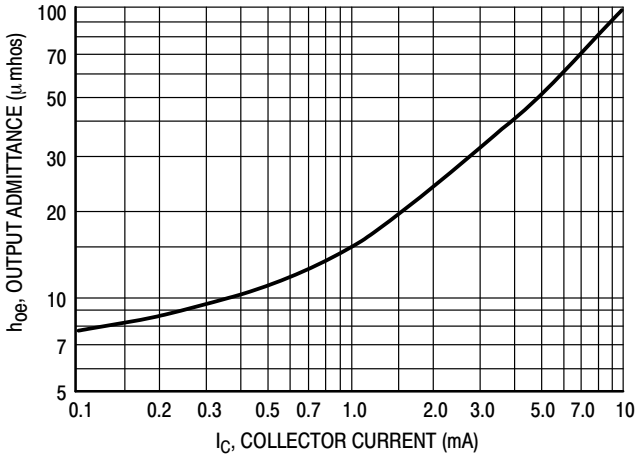


**Figure 6. Output Admittance**

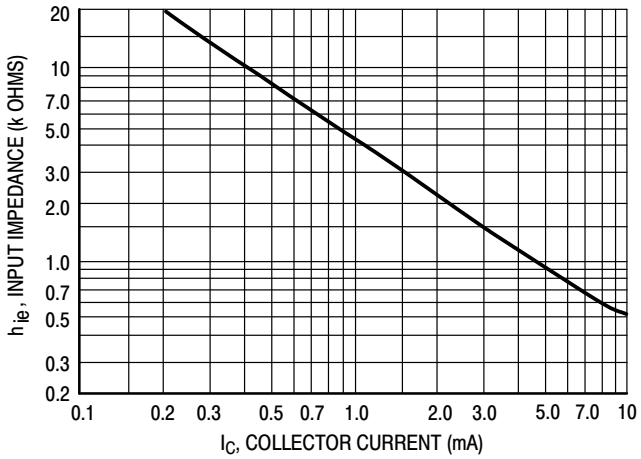


**Figure 7. Input Impedance**

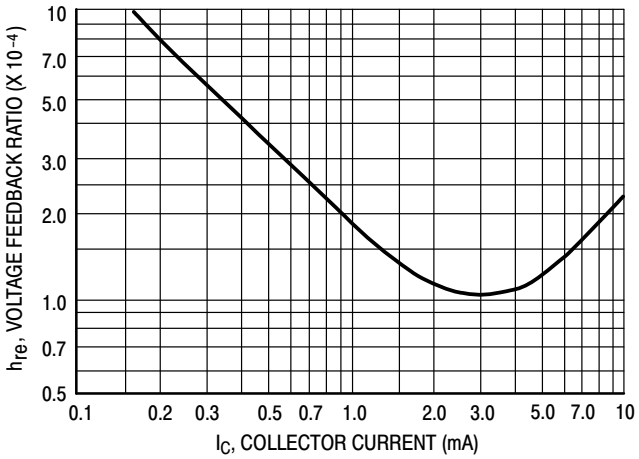


**Figure 8. Voltage Feedback Ratio**



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## TYPICAL STATIC CHARACTERISTICS

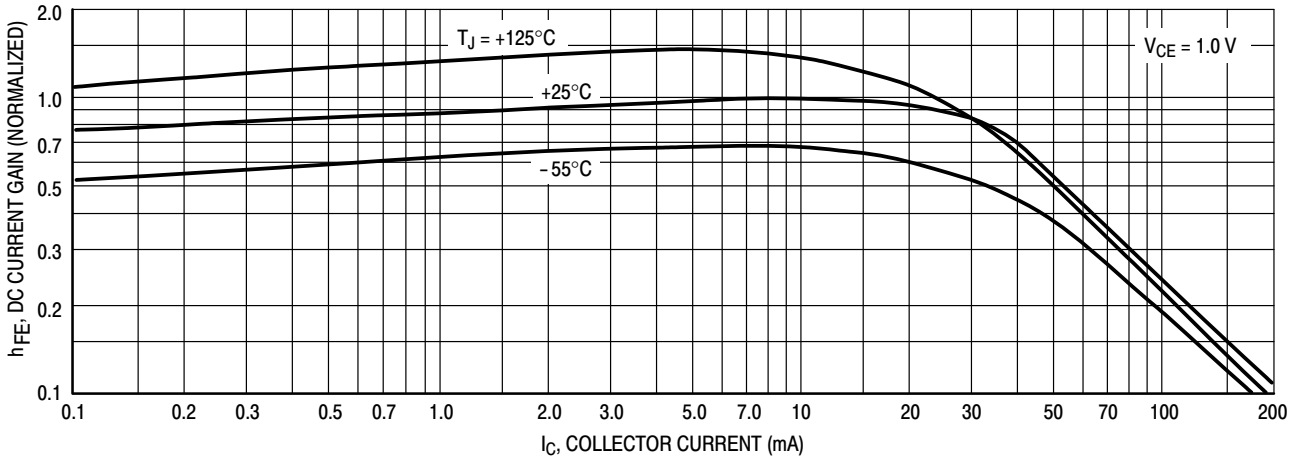


**Figure 9. DC Current Gain**

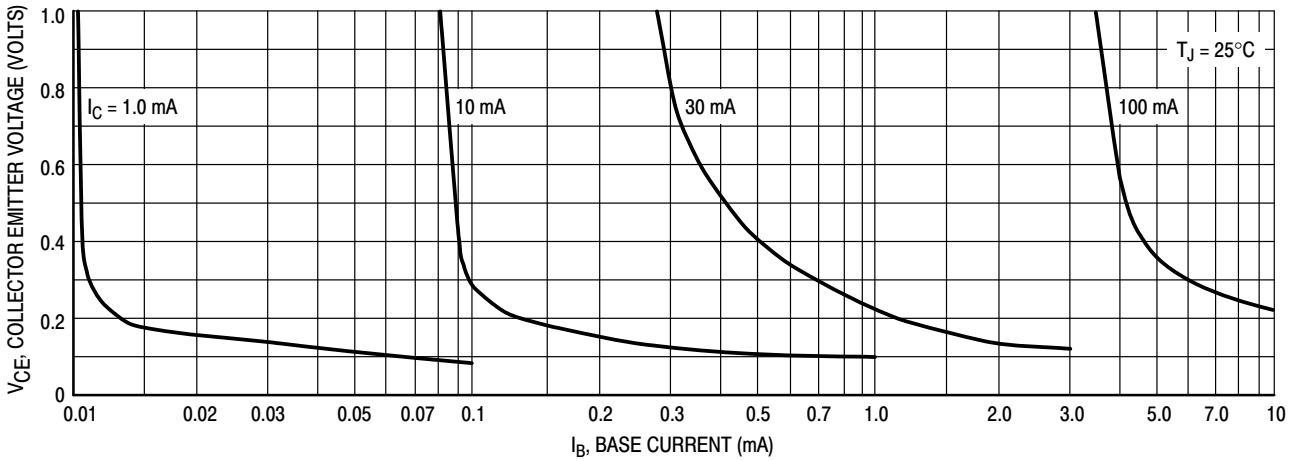


**Figure 10. Collector Saturation Region**

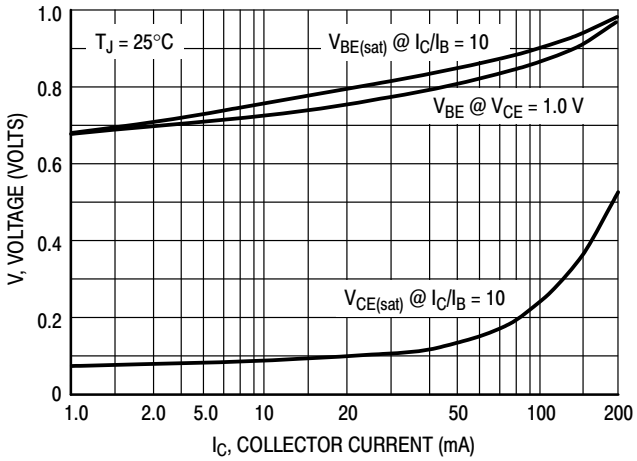


**Figure 11. "ON" Voltages**

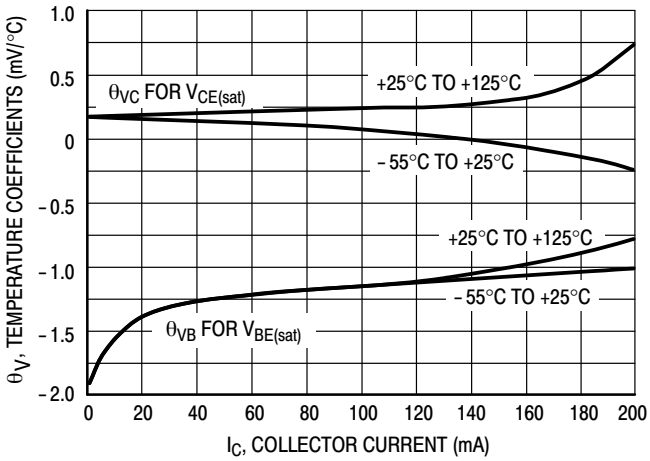


**Figure 12. Temperature Coefficients**



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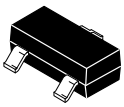
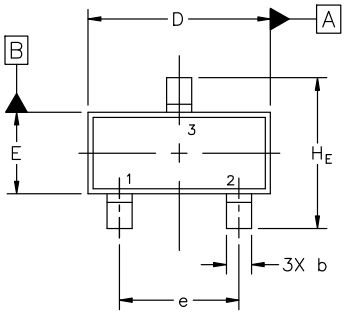


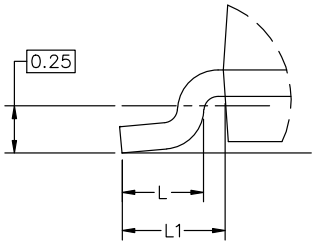
SCALE 4:1

**SOT−23 (TO−236) 2.90x1.30x1.00 1.90P**
CASE 318
ISSUE AU

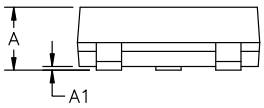
DATE 14 AUG 2024



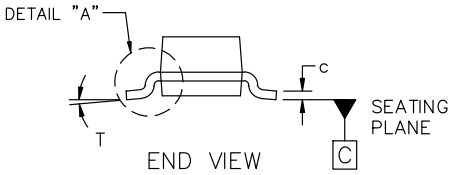

TOP VIEW




DETAIL "A"
Scale 3:1




SIDE VIEW

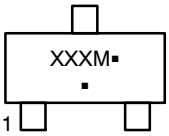



END VIEW

| MILLIMETERS | | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | 0.89 | 1.00 | 1.11 |
| A1 | 0.01 | 0.06 | 0.10 |
| b | 0.37 | 0.44 | 0.50 |
| c | 0.08 | 0.14 | 0.20 |
| D | 2.80 | 2.90 | 3.04 |
| E | 1.20 | 1.30 | 1.40 |
| e | 1.78 | 1.90 | 2.04 |
| L | 0.30 | 0.43 | 0.55 |
| L1 | 0.35 | 0.54 | 0.69 |
| $H_E$ | 2.10 | 2.40 | 2.64 |
| T | 0° | −−− | 10° |

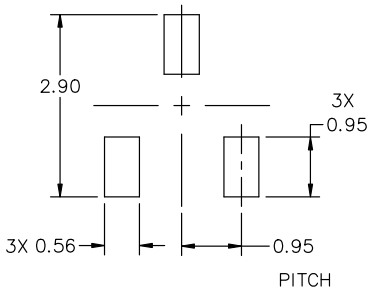
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

**GENERIC MARKING DIAGRAM***




XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.




RECOMMENDED
MOUNTING FOOTPRINT

* For additional information on our Pb−Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**STYLES ON PAGE 2**

| | | |
|---|---|---|
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CASE 318
ISSUE AU

DATE 14 AUG 2024

STYLE 1 THRU 5:
CANCELLED

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 7:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 8:
PIN 1. ANODE
2. NO CONNECTION
3. CATHODE

STYLE 9:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 11:
PIN 1. ANODE
2. CATHODE
3. CATHODE−ANODE

STYLE 12:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 13:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 14:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 15:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 16:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 17:
PIN 1. NO CONNECTION
2. ANODE
3. CATHODE

STYLE 18:
PIN 1. NO CONNECTION
2. CATHODE
3. ANODE

STYLE 19:
PIN 1. CATHODE
2. ANODE
3. CATHODE−ANODE

STYLE 20:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 22:
PIN 1. RETURN
2. OUTPUT
3. INPUT

STYLE 23:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 24:
PIN 1. GATE
2. DRAIN
3. SOURCE

STYLE 25:
PIN 1. ANODE
2. CATHODE
3. GATE

STYLE 26:
PIN 1. CATHODE
2. ANODE
3. NO CONNECTION

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

STYLE 28:
PIN 1. ANODE
2. ANODE
3. ANODE




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