

# General Purpose Amplifier Transistor

## MSC2712GT1G, MSC2712YT1G

### NPN Surface Mount

#### Features

- Moisture Sensitivity Level: 1
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

| Rating                         | Symbol        | Value | Unit |
|--------------------------------|---------------|-------|------|
| Collector-Base Voltage         | $V_{(BR)CBO}$ | 60    | Vdc  |
| Collector-Emitter Voltage      | $V_{(BR)CEO}$ | 50    | Vdc  |
| Emitter-Base Voltage           | $V_{(BR)EBO}$ | 7.0   | Vdc  |
| Collector Current - Continuous | $I_C$         | 100   | mAdc |
| Collector Current - Peak       | $I_{C(P)}$    | 200   | mAdc |

#### THERMAL CHARACTERISTICS

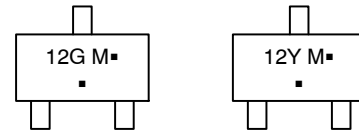
| Characteristic       | Symbol    | Max         | Unit             |
|----------------------|-----------|-------------|------------------|
| Power Dissipation    | $P_D$     | 200         | mW               |
| Junction Temperature | $T_J$     | 150         | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

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.

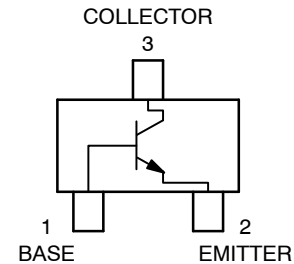


SC-59  
CASE 318D  
STYLE 1

#### MARKING DIAGRAM



12M, 12Y = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)



#### ORDERING INFORMATION

| Device      | Package            | Shipping†             |
|-------------|--------------------|-----------------------|
| MSC2712GT1G | SC-59<br>(Pb-Free) | 3000 /<br>Tape & Reel |

#### DISCONTINUED (Note 1)

|             |                    |                       |
|-------------|--------------------|-----------------------|
| MSC2712YT1G | SC-59<br>(Pb-Free) | 3000 /<br>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](#).

- DISCONTINUED:** This device is not recommended for new design. Please contact your onsemi representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).

# MSC2712GT1G, MSC2712YT1G

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Characteristic                                                                                                                                                                                                | Symbol               | Min                | Max                | Unit                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|--------------------|----------------------|
| Collector–Emitter Breakdown Voltage<br>(I <sub>C</sub> = 2.0 mAdc, I <sub>B</sub> = 0)                                                                                                                        | V <sub>(BR)CEO</sub> | 50                 | –                  | Vdc                  |
| Collector–Base Breakdown Voltage<br>(I <sub>C</sub> = 10 µAdc, I <sub>E</sub> = 0)                                                                                                                            | V <sub>(BR)CBO</sub> | 60                 | –                  | Vdc                  |
| Emitter–Base Breakdown Voltage<br>(I <sub>E</sub> = 10 µAdc, I <sub>C</sub> = 0)                                                                                                                              | V <sub>(BR)EBO</sub> | 7.0                | –                  | Vdc                  |
| Collector–Base Cutoff Current<br>(V <sub>CB</sub> = 45 Vdc, I <sub>E</sub> = 0)                                                                                                                               | I <sub>CBO</sub>     | –                  | 0.1                | µAdc                 |
| Collector–Emitter Cutoff Current<br>(V <sub>CE</sub> = 10 Vdc, I <sub>B</sub> = 0)<br>(V <sub>CE</sub> = 30 Vdc, I <sub>B</sub> = 0)<br>(V <sub>CE</sub> = 30 Vdc, I <sub>B</sub> = 0, T <sub>A</sub> = 80°C) | I <sub>CEO</sub>     | –<br>–<br>–        | 0.1<br>2.0<br>1.0  | µAdc<br>µAdc<br>mAdc |
| DC Current Gain (Note 1)<br>(V <sub>CE</sub> = 6.0 Vdc, I <sub>C</sub> = 2.0 mAdc)<br><br>MSC2712GT1G<br>MSC2712YT1G                                                                                          | h <sub>FE</sub>      | <br><br>200<br>120 | <br><br>400<br>240 | –                    |
| Collector–Emitter Saturation Voltage<br>(I <sub>C</sub> = 100 mAdc, I <sub>B</sub> = 10 mAdc)                                                                                                                 | V <sub>CE(sat)</sub> | –                  | 0.5                | Vdc                  |
| Current – Gain – Bandwidth Product<br>(I <sub>C</sub> = 1 mA, V <sub>CE</sub> = 10.0 V, f = 10 MHz)                                                                                                           | f <sub>T</sub>       | 50                 | –                  | MHz                  |

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.

1. Pulse Test: Pulse Width ≤ 300 µs, D.C. ≤ 2%.

TYPICAL ELECTRICAL CHARACTERISTICS

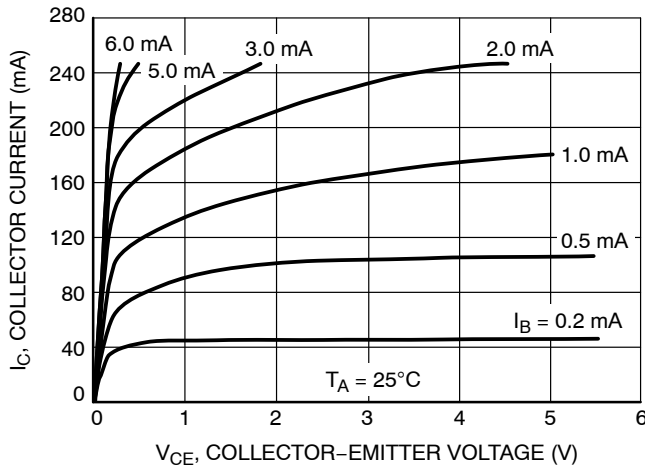


Figure 1. Collector Saturation Voltage

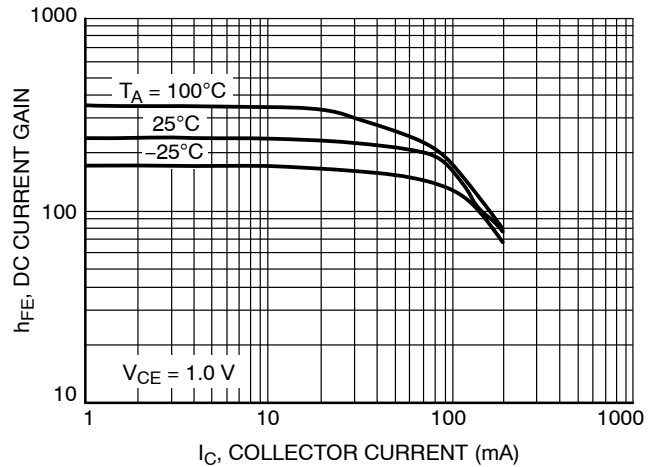


Figure 2. DC Current Gain

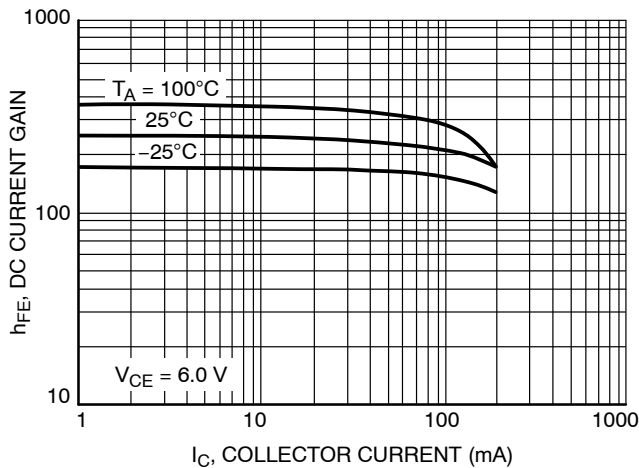


Figure 3. DC Current Gain

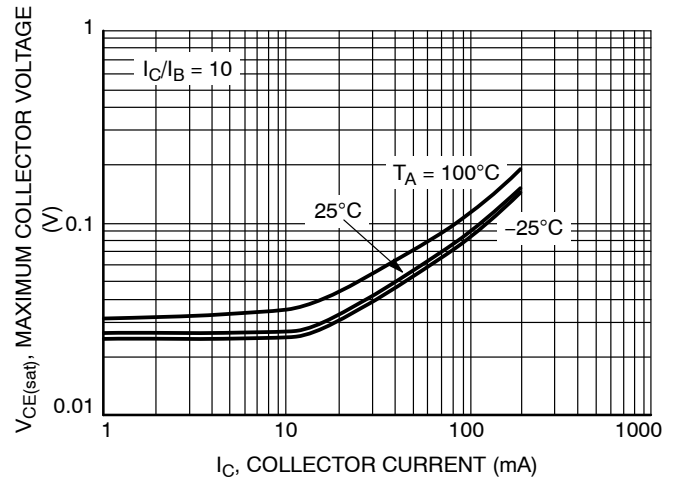


Figure 4.  $V_{CE(sat)}$  versus  $I_C$

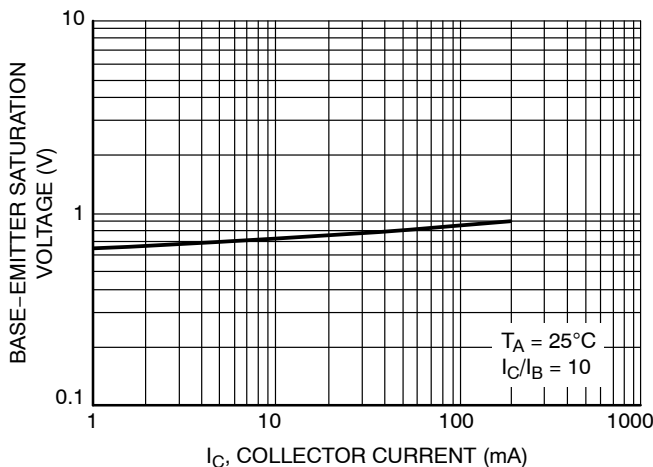


Figure 5.  $V_{BE(sat)}$  versus  $I_C$

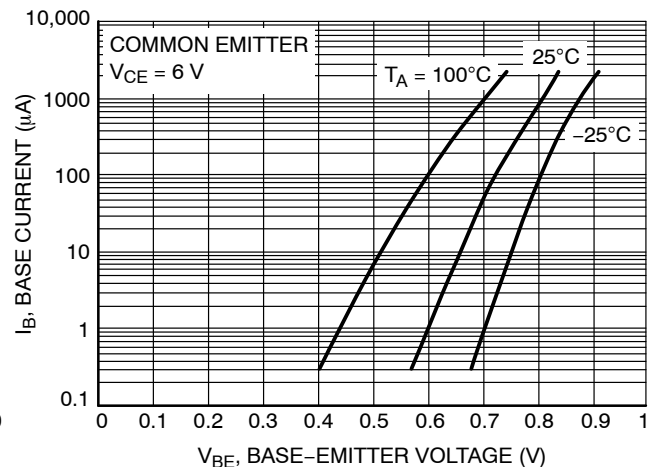


Figure 6. Base-Emitter Voltage

# MSC2712GT1G, MSC2712YT1G

## TYPICAL ELECTRICAL CHARACTERISTICS

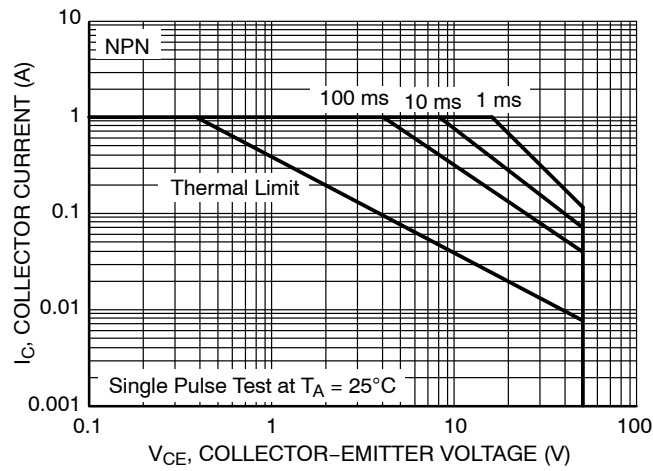
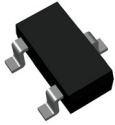
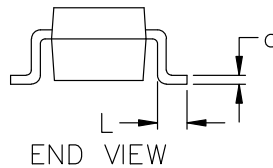
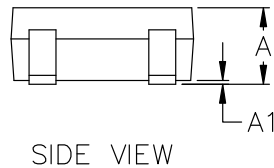
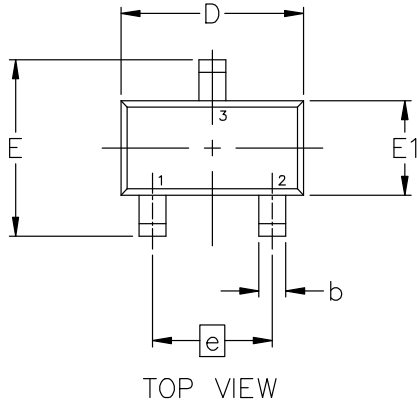


Figure 7. NPN Safe Operating Area



SC-59-3 2.90x1.50x1.15, 1.90P  
CASE 318D  
ISSUE J

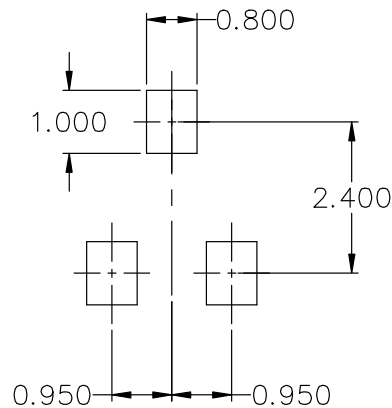
DATE 15 FEB 2024



NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
2. ALL DIMENSION ARE IN MILLIMETERS.

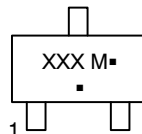
| DIM | MILLIMETERS |      |      |
|-----|-------------|------|------|
|     | MIN.        | NOM. | MAX. |
| A   | 1.00        | 1.15 | 1.30 |
| A1  | 0.01        | 0.06 | 0.10 |
| b   | 0.35        | 0.43 | 0.50 |
| c   | 0.09        | 0.14 | 0.18 |
| D   | 2.70        | 2.90 | 3.10 |
| E   | 2.50        | 2.80 | 3.00 |
| E1  | 1.30        | 1.50 | 1.70 |
| e   | 1.90 BSC    |      |      |
| L   | 0.20        | 0.40 | 0.60 |



RECOMMENDED MOUNTING FOOTPRINT\*

- \* FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

GENERIC  
MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package\*

(\*Note: Microdot may be in either location)

\*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.

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

STYLE 2:  
PIN 1. ANODE  
2. N.C.  
3. CATHODE

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

STYLE 4:  
PIN 1. CATHODE  
2. N.C.  
3. ANODE

STYLE 5:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE

STYLE 6:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE/CATHODE

|                  |                               |                                                                                                                                                                                  |
|------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | SC-59-3 2.90x1.50x1.15, 1.90P | PAGE 1 OF 1                                                                                                                                                                      |

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