



SOT-23 Bias Resistor Transistors

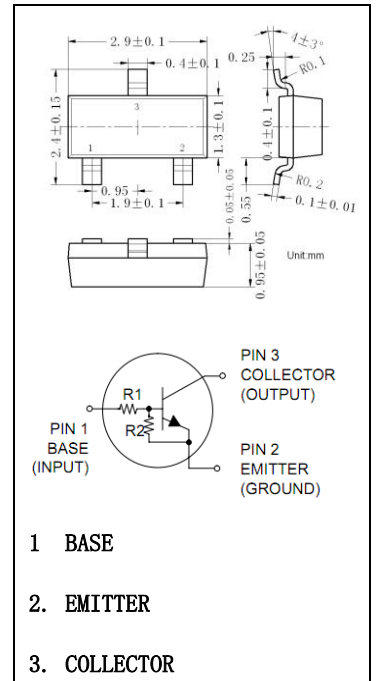
MMUN2211LT3G TRANSISTOR (NPN)

NPN Silicon Surface Mount Transistor 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.

Features

- Simplifies Circuit Design
- Reduces Board Space and Component Count
- Pb-Free Packages are Available



MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage	50	V
V _{CEO}	Collector-Emitter Voltage	50	V
I _C	Collector Current	100	mA

THERMAL CHARACTERISTICS

Characteristic	symbol	max	unit
Total Device Dissipation T _A =25°C Derate above 25°C	P _D	246(Note1) 400(Note2) 1.5(Note1) 2.0(Note2)	mW °C/W
Thermal resistance, junction-to-Ambient	R _{θJA}	508(Note1) 311 (Note2)	°C/W
Thermal resistance, junction-to-lead	R _{θJL}	174(Note1) 208(Note2)	°C/W
Junction and storage temperature range	T _J , T _{stg}	-55 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. FR-4 @ minimum pad
2. FR-4 @ 1.0 x 1.0 inch pad

ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C =10μA, I _E =0	50			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C =2mA, I _B =0	50			V
Collector-Base cut-off current	I _{CBO}	V _{CB} =50V, I _E =0			100	nA
Collector-Emitter cut-off current	I _{CEO}	V _{CE} =50V, I _B =0			500	nA
Emitter- Base cut-off current	I _{EBO}	V _{EB} =6V, I _C =0			0.5	mA
DC current gain	h _{FE}	V _{CE} =10V, I _C =5mA	35	60		
Collector-emitter saturation voltage	V _{CE(sat)}	I _C =10 mA, I _B =0.3mA			0.25	V
Output voltage(on)	V _{OL}	V _{Cc} =5V, V _B =2.5V, R _L =1.0KΩ			0.2	V
Output voltage(off)	V _{OH}	V _{Cc} =5V, V _B =0.5V, R _L =1.0KΩ	4.9			V

ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit
Input resistor	R1	7.0	10	13	KΩ
Resistor ratio	R1/R2	0.8	1.0	1.2	

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

Typical Characteristics

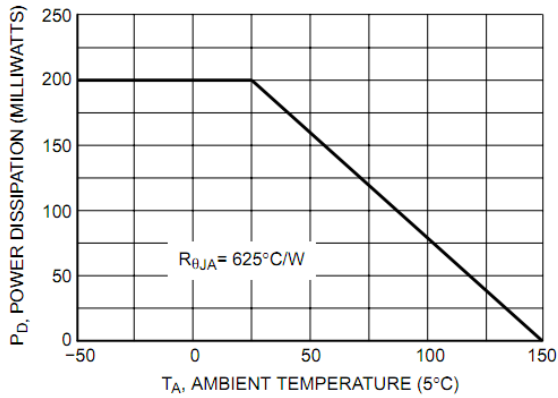


Figure 1. Derating Curve

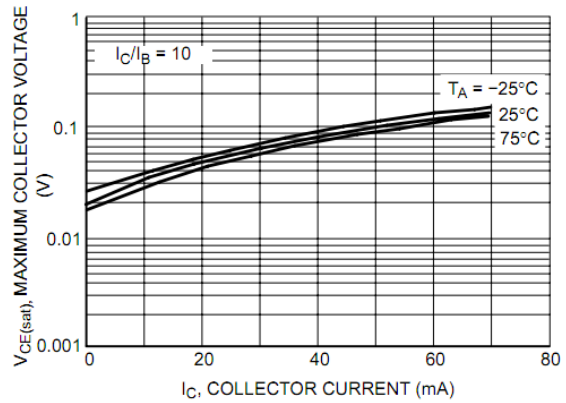


Figure 2. V_{CE(sat)} vs. I_C

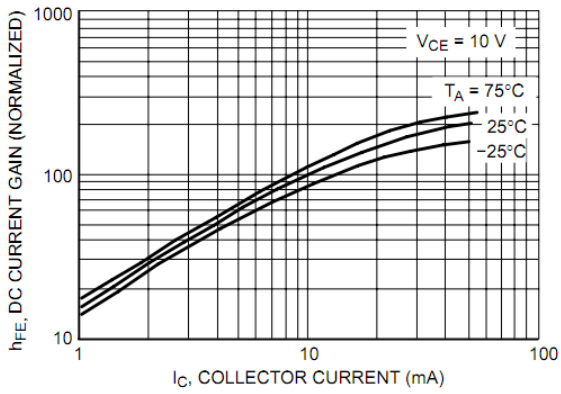


Figure 3. DC Current Gain

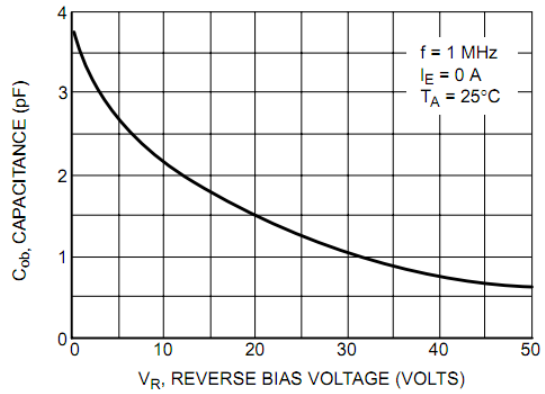


Figure 4. Output Capacitance

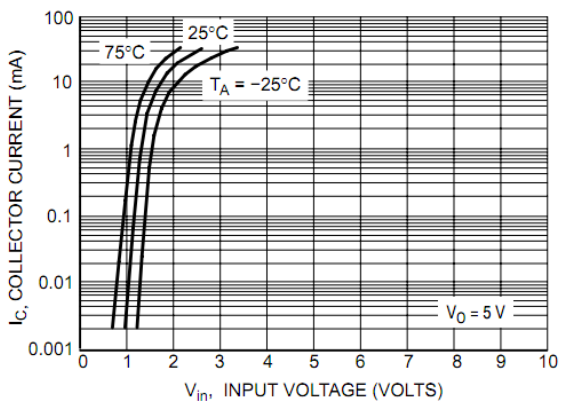


Figure 5. Output Current vs. Input Voltage

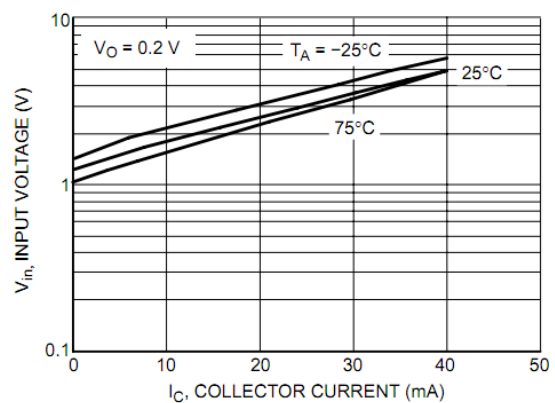


Figure 6. Input Voltage vs. Output Current