PNP General Purpose Transistor

The MMBT2907AM3T5G device is a spin-off of our popular SOT-23 three-leaded device. It is designed for general purpose amplifier applications and is housed in the SOT-723 surface mount package. This device is ideal for low-power surface mount applications where board space is at a premium.

Features

- Reduces Board Space
- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC–Q101 Qualified and PPAP Capable
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	-60	Vdc
Collector-Base Voltage	V _{CBO}	-60	Vdc
Emitter-Base Voltage	V _{EBO}	-5.0	Vdc
Collector Current – Continuous	Ι _C	-600	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Мах	Unit
Total Device Dissipation FR-5 Board (Note 1) $T_A = 25^{\circ}C$ Derate above $25^{\circ}C$	P _D	265 2.1	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	470	°C/W
Total Device Dissipation Alumina Substrate, (Note 2) T _A = 25°C Derate above 25°C	P _D	640 5.1	mW mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{ hetaJA}$	195	°C/W
Junction and Storage Temperature	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.

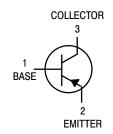
1. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

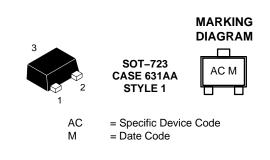
2. Alumina = 0.4 \times 0.3 \times 0.024 in. 99.5% alumina.



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ORDERING INFORMATION

Device	Package	Shipping [†]
MMBT2907AM3T5G	SOT-723 (Pb-Free)	8000/Tape & Reel
NSVMMBT2907AM3T5G	SOT-723 (Pb-Free)	8000/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.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (Note 3) $(I_C = -10 \text{ mAdc}, I_B = 0)$	V _{(BR)CEO}	-60	-	Vdc
Collector – Base Breakdown Voltage $(I_C = -10 \ \mu Adc, I_E = 0)$	V _(BR) CBO	-60	_	Vdc
Emitter-Base Breakdown Voltage ($I_E = -10 \ \mu Adc, I_C = 0$)	V _{(BR)EBO}	-5.0	_	Vdc
Collector Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB(off)} = -0.5 \text{ Vdc}$)	I _{CEX}	_	-50	nAdc
Collector Cutoff Current ($V_{CB} = -50 \text{ Vdc}, I_E = 0$) ($V_{CB} = -50 \text{ Vdc}, I_E = 0, T_A = 125^{\circ}C$)	I _{CBO}		-0.010 -10	μAdc
Base Cutoff Current (V _{CE} = -30 Vdc, V _{EB(off)} = -0.5 Vdc)	I _{BL}	-	-50	nAdc
ON CHARACTERISTICS		•	•	•

DC Current Gain	h _{FE}			-
$(I_{C} = -0.1 \text{ mAdc}, V_{CE} = -10 \text{ Vdc})$		75	-	
$(I_{C} = -1.0 \text{ mAdc}, V_{CE} = -10 \text{ Vdc})$		100	-	
$(I_{C} = -10 \text{ mAdc}, V_{CE} = -10 \text{ Vdc})$		100	-	
$(I_{C} = -150 \text{ mAdc}, V_{CE} = -10 \text{ Vdc})$		100	300	
$(I_{C} = -500 \text{ mAdc}, V_{CE} = -10 \text{ Vdc})$ (Note 3)		50	-	
Collector – Emitter Saturation Voltage (Note 3)	V _{CE(sat)}			Vdc
$(I_{C} = -150 \text{ mAdc}, I_{B} = -15 \text{ mAdc})$ (Note 3)	. ,	-	-0.4	
$(I_{C} = -500 \text{ mAdc}, I_{B} = -50 \text{ mAdc})$		-	-1.6	
Base – Emitter Saturation Voltage (Note 3)	V _{BE(sat)}			Vdc
$(I_{C} = -150 \text{ mAdc}, I_{B} = -15 \text{ mAdc})$. ,	-	-1.3	
$(I_{C} = -500 \text{ mAdc}, I_{B} = -50 \text{ mAdc})$		-	-2.6	

SMALL-SIGNAL CHARACTERISTICS

Current-Gain – Bandwidth Product (Notes 3, 4) ($I_C = -50 \text{ mAdc}, V_{CE} = -20 \text{ Vdc}, f = 100 \text{ MHz}$)	f _T	200	_	MHz
Output Capacitance (V _{CB} = -10 Vdc, I _E = 0, f = 1.0 MHz)	C _{obo}	-	8.0	pF
Input Capacitance ($V_{EB} = -2.0 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz}$)	C _{ibo}	I	30	

SWITCHING CHARACTERISTICS

Turn–On Time		t _{on}	-	45	
Delay Time	$(V_{CC} = -30 \text{ Vdc}, I_C = -150 \text{ mAdc}, I_{B1} = -15 \text{ mAdc})$	t _d	-	10	
Rise Time		t _r	-	40	
Turn–Off Time		t _{off}	-	100	ns
Storage Time	$(V_{CC} = -6.0 \text{ Vdc}, I_C = -150 \text{ mAdc}, I_{B1} = I_{B2} = -15 \text{ mAdc})$	t _s	-	80	
Fall Time		t _f	-	30]

 $\begin{array}{ll} \mbox{3. Pulse Test: Pulse Width} \leq 300 \ \mu \mbox{s, Duty Cycle} \leq 2.0\%. \\ \mbox{4. } f_T \mbox{ is defined as the frequency at which } |h_{fe}| \ extrapolates to unity. \\ \end{array}$

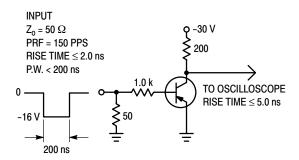
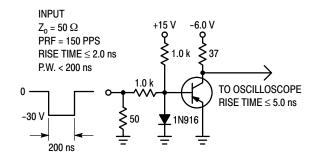
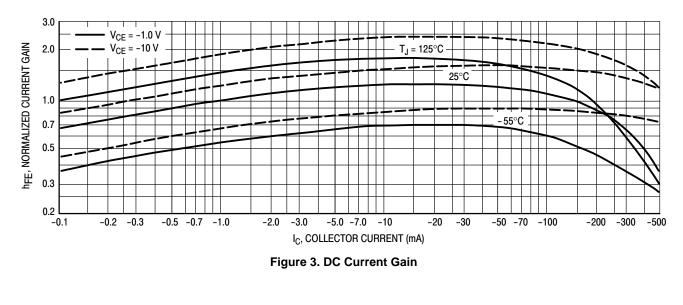


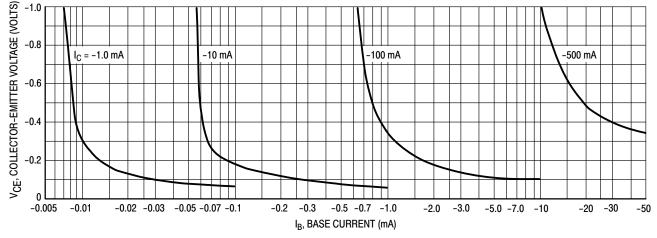
Figure 1. Delay and Rise Time Test Circuit



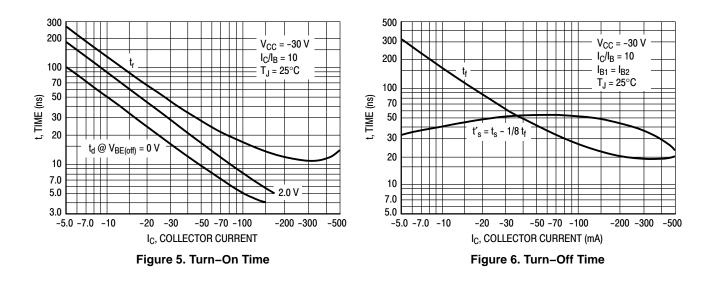


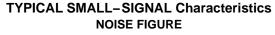
TYPICAL CHARACTERISTICS



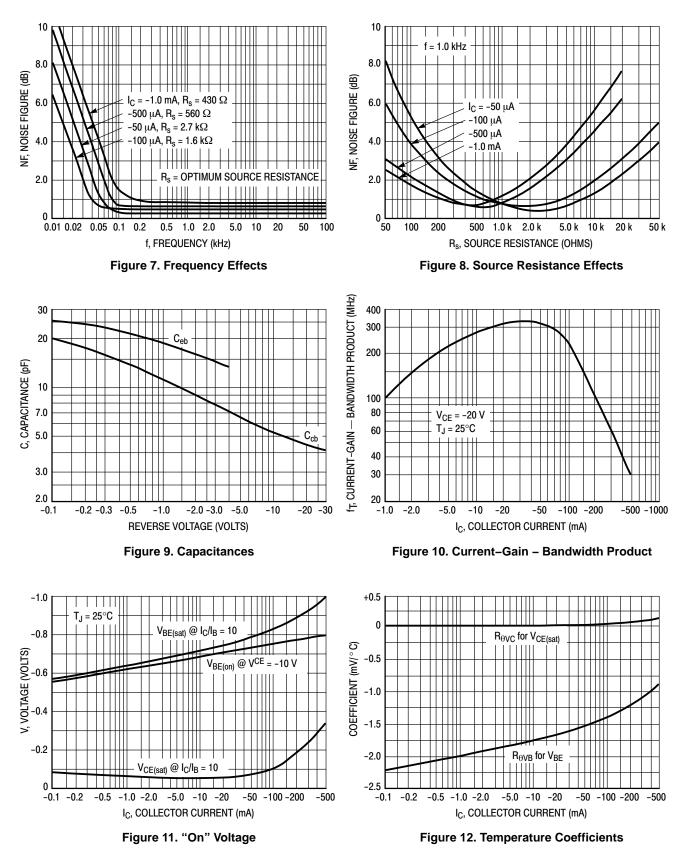






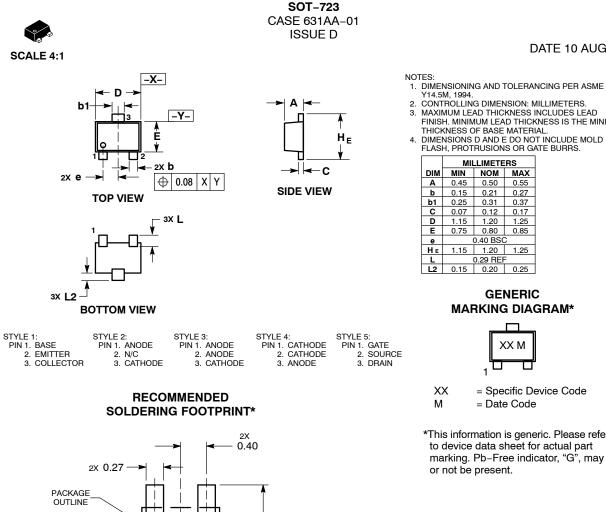


 V_{CE} = 10 Vdc, T_A = 25°C



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DATE 10 AUG 2009

- THISH. MINIMUM LEAD THICKNESS INCLOSE LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

	MILLIMETERS			
DIM	MIN	NOM	MAX	
Α	0.45	0.50	0.55	
b	0.15	0.21	0.27	
b1	0.25	0.31	0.37	
С	0.07	0.12	0.17	
D	1.15	1.20	1.25	
Е	0.75	0.80	0.85	
е		0.40 BSC	2	
ΗE	1.15	1.20	1.25	
L	0.29 REF			
L2	0.15	0.20	0.25	

GENERIC **MARKING DIAGRAM***

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1		Π

= Specific Device Code

= Date Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present.

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

0.36 DIMENSIONS: MILLIMETERS

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