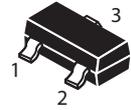
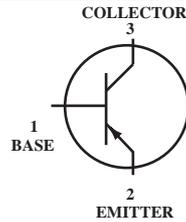


PNP General Purpose Transistors

 Lead(Pb)-Free



SOT-23

MAXIMUM RATINGS

Rating	Symbol	2907	2907A	Unit
Collector-Emitter Voltage	V_{CEO}	-40	-60	Vdc
Collector-Base Voltage	V_{CBO}		-60	Vdc
Emitter-Base Voltage	V_{EBO}		-5.0	Vdc
Collector Current-Continuous	I_C		-600	mAdc

THERMAL CHARACTERISTICS

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

DEVICE MARKING

MMBT2907=M2B; MMBT2907A=2F

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = -10 \text{ mAdc}, I_B = 0$)	MMBT2907 MMBT2907A	$V_{(BR)CEO}$	-40 -60	-	Vdc
Collector-Base Breakdown Voltage ($I_C = -10 \mu\text{Adc}, I_E = 0$)		$V_{(BR)CBO}$	-60	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = -10 \mu\text{Adc}, I_C = 0$)		$V_{(BR)EBO}$	-5.0	-	Vdc
Collector Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB}(\text{off}) = -0.5 \text{ Vdc}$)		I_{CEX}	-	-50	nAdc
Collector Cutoff Current ($V_{CB} = -50 \text{ Vdc}, I_E = 0$) ($V_{CB} = -50 \text{ Vdc}, I_E = 0, T_A = 125^\circ\text{C}$)	MMBT2907 MMBT2907A MMBT2907 MMBT2907A	I_{CBO}	-	-0.020 -0.010 -20 -10	nAdc
Base Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB}(\text{off}) = -0.5 \text{ Vdc}$)	MMBT2907A	I_B	-	-50	nAdc

1.FR-5=1.0 x 0.75 x 0.062 in

2.Alumina=0.4 x 0.3 x 0.024 in. 99.5% alumina

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

Characteristics	Symbol	Min	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C = -0.1 \text{ mAdc}, V_{CE} = -10 \text{ Vdc}$)	MMBT2907 MMBT2907A	h _{FE}	35 75	- -	
($I_C = -1.0 \text{ mAdc}, V_{CE} = -10 \text{ Vdc}$)	MMBT2907 MMBT22907A		50 100	- -	
($I_C = -10 \text{ mAdc}, V_{CE} = -10 \text{ Vdc}$)	MMBT2907 MMBT22907A		75 100	- -	
($I_C = -150 \text{ mAdc}, V_{CE} = -10 \text{ Vdc}$)	MMBT2907 MMBT2907A		100	300	
($I_C = -500 \text{ mAdc}, V_{CE} = -10 \text{ Vdc}$)	MMBT2907 MMBT2907A		30 50	- -	
Collector-Emitter Saturation Voltage ($I_C = -150 \text{ mAdc}, I_B = -15 \text{ mAdc}$) ($I_C = -500 \text{ mAdc}, I_B = -50 \text{ mAdc}$)		V _{CE(sat)}	- -	-0.4 -1.6	Vdc
Base-Emitter Saturation Voltage ($I_C = -150 \text{ mAdc}, I_B = -15 \text{ mAdc}$) ($I_C = -500 \text{ mAdc}, I_B = -50 \text{ mAdc}$)		V _{BE(sat)}	- -	-1.3 -2.6	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product (1),(2) ($I_C = -50 \text{ mAdc}, V_{CE} = -20 \text{ Vdc}, f = 100 \text{ MHz}$)	f _T	200	- -	MHz
Output Capacitance ($V_{CB} = -10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C _{obo}	-	8.0	pF
Input Capacitance ($V_{EB} = -2.0 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz}$)	C _{ibo}	-	30	pF

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

Characteristics	Symbol	Min	Max	Unit
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SWITCHING CHARACTERISTICS

Turn-On Time	(V _{CC} = -30 Vdc, I _C = -150 mAdc, I _{B1} = -15 mAdc)	t _{on}	-	45	ns
Delay Time		t _d	-	10	
Rise Time		t _r	-	40	
Turn-Off Time	(V _{CC} = -60 Vdc, I _C = -150 mAdc, I _{B1} = I _{B2} = -15 mAdc)	t _{off}	-	100	
Storage Time		t _s	-	80	
Fall Time		t _f	-	30	

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

2. f_T is defined as the frequency at which |h_{FE}| extrapolates to unity.

Typical Electrical Characteristics

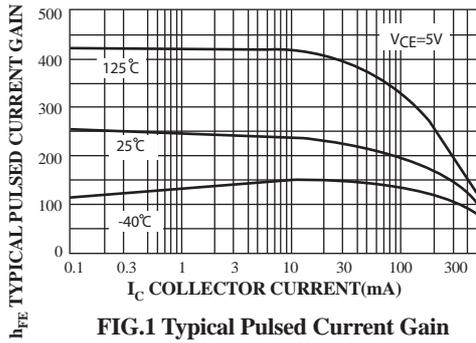


FIG.1 Typical Pulsed Current Gain vs Collector Current

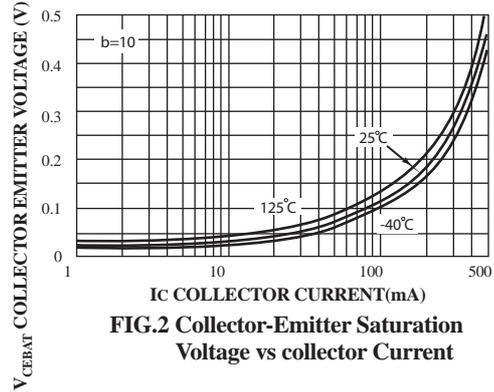


FIG.2 Collector-Emitter Saturation Voltage vs collector Current

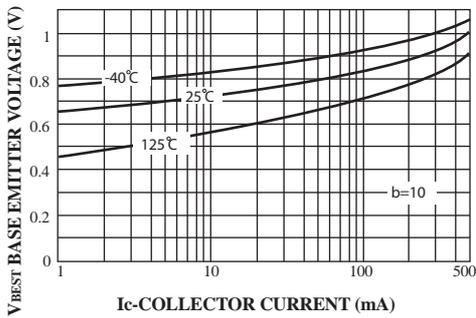


FIG.3 Base-Emitter Saturation Voltage vs Collector Current

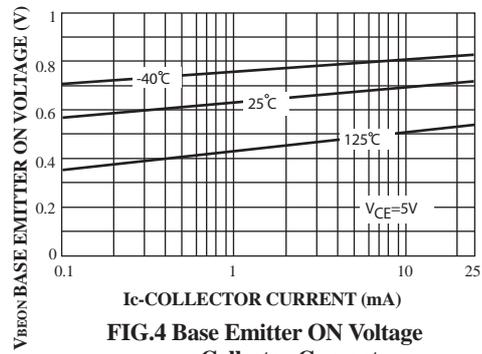


FIG.4 Base Emitter ON Voltage vs Collector Current

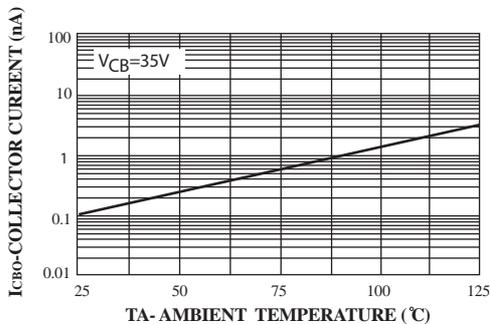


FIG.5 Collector-Cutoff Current vs Ambient Temperature

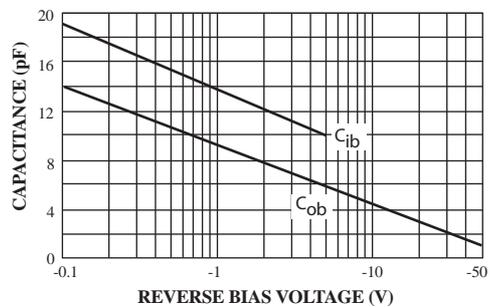
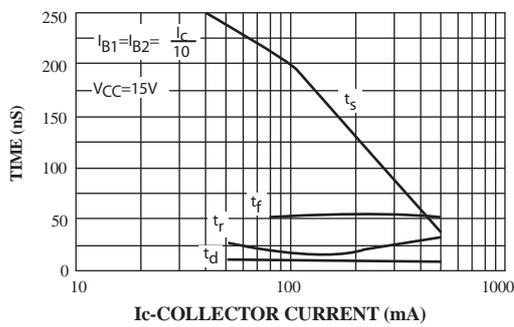
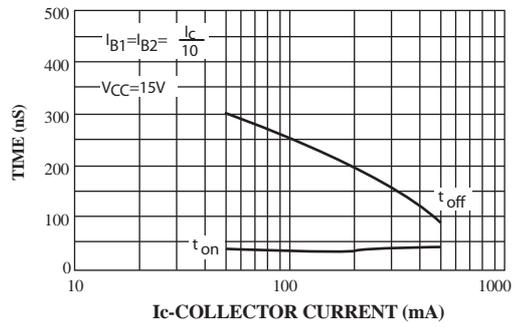


FIG.6 Input and Output Capacitance vs Reverse Bias Voltage

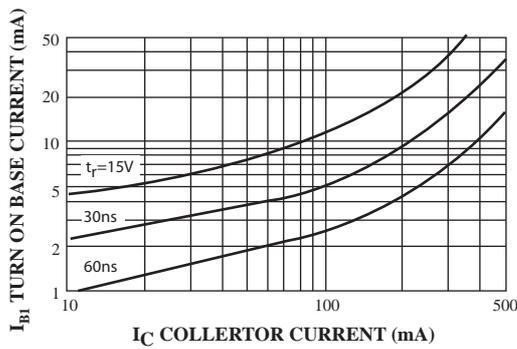
Typical Characteristics(Continued)



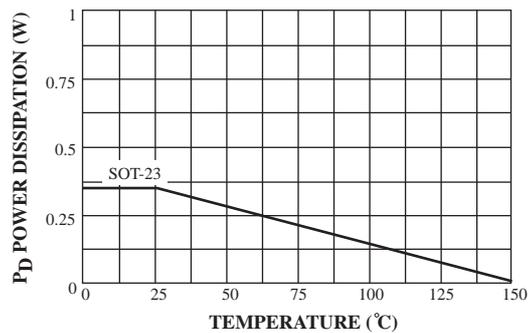
**FIG.7 Switching Times
vs Collector Current**



**FIG.8 Turn On and Turn Off Times
vs Collector Current**



**FIG.9 Rise Time vs Collector
and Turn On Base Current**



**FIG.10 Power Dissipation
vs Ambient Temperature**

TEST CIRCUIT

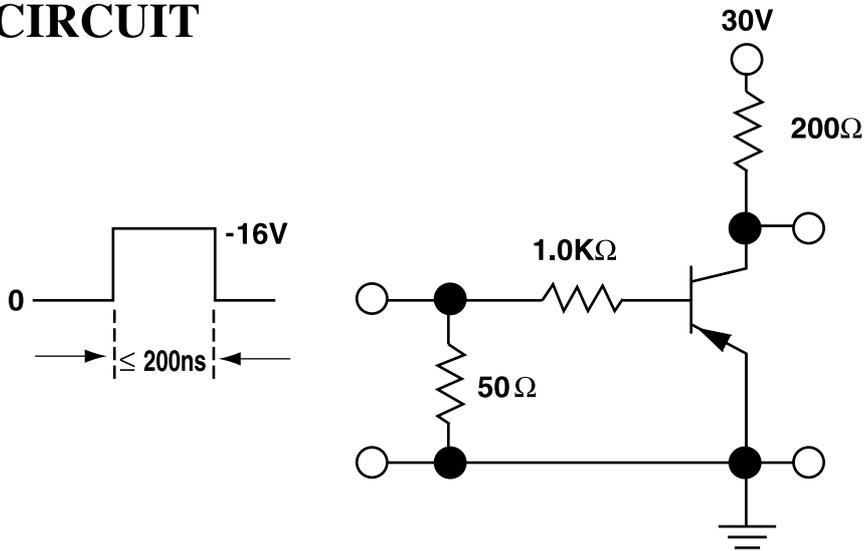


FIG.11 Saturated Turn-On Switching Time

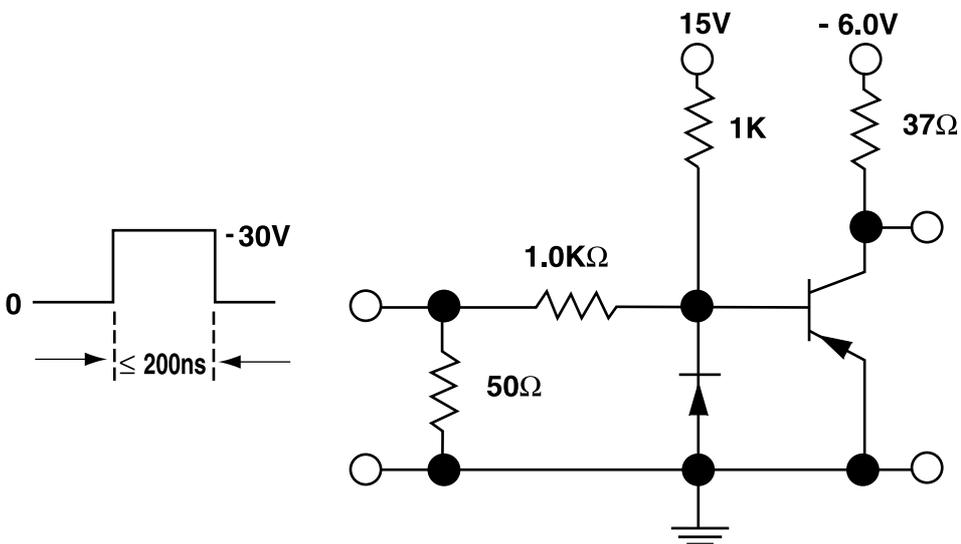
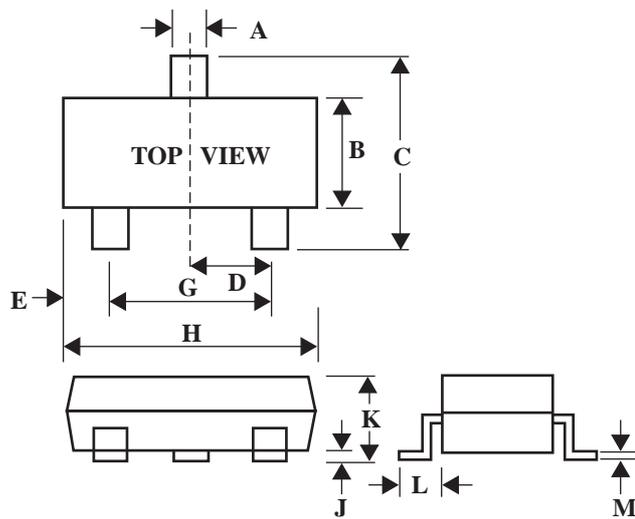


FIG.12 Saturated Turn-Off Switching Time

SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25