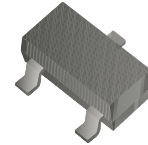


General Purpose Transistors PNP

RoHS Device

Halogen Free



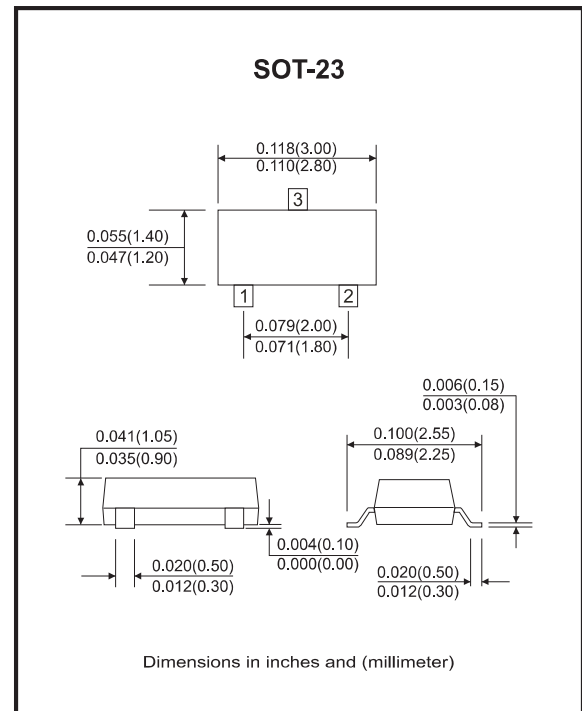
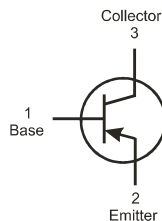
Features

- Epitaxial planar die construction.
- Device is designed as a general purpose amplifier and switching.

Mechanical data

- Case: SOT-23, molded plastic.
- Terminals: Solderable per MIL-STD-750, method 2026.
- Weight: 0.0078 grams(approx.).

Circuit diagram



Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Emitter voltage	V_{CE0}	-60	V
Collector-Base voltage	V_{CBO}	-60	V
Emitter-Base voltage	V_{EBO}	-5	V
Collector current-continuous	I_C	-600	mA

Thermal Characteristics (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Value	Unit
Total device dissipation	FR-5 board (Note.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 (Note.1)	$R_{\theta JA}$	556	$^{\circ}\text{C/W}$
Total device dissipation	Alumina substrate (Note.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 (Note.2)	$R_{\theta JA}$	417	$^{\circ}\text{C/W}$
Junction temperature range		T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range		T_{STG}	-55 to +150	$^{\circ}\text{C}$

Note. 1. FR-5= 1.0X0.75X0.062 in

2. Alumina = 0.4X0.3X0.024 in . 99.5% alumina.

Electrical Characteristics (@ $T_A=25^{\circ}\text{C}$ unless otherwise noted)**OFF CHARACTERISTICS**

Parameter	Symbol	Conditions	Min.	Max.	Unit
Collector-Emitter breakdown voltage	$V_{BR(CEO)}$	$I_C=-10\text{mA}$, $I_B=0$	-60		V
Collector-Base breakdown voltage	$V_{BR(CBO)}$	$I_C=-10\mu\text{A}$, $I_E=0$	-60		V
Emitter-Base breakdown voltage	$V_{BR(EBO)}$	$I_E=-10\mu\text{A}$, $I_C=0$	-5		V
Collector cut-off current	I_{CEX}	$V_{CE}=-30\text{V}$, $V_{EB(off)}=-0.5\text{V}$		-50	nA
Collector cut-off current	I_{CBO}	$V_{CB}=-50\text{V}$, $I_E=0$	$T_A=25^{\circ}\text{C}$	-0.01	μA
			$T_A=125^{\circ}\text{C}$	-10	
Base current	I_B	$V_{CE}=-30\text{V}$, $V_{EB(off)}=-0.5\text{V}$		-50	nA

ON CHARACTERISTICS (Note.1)

DC current gain	h_{FE}	$V_{CE}=-10\text{V}$, $I_C=-0.1\text{mA}$	75		
		$V_{CE}=-10\text{V}$, $I_C=-1.0\text{mA}$	100		
		$V_{CE}=-10\text{V}$, $I_C=-10\text{mA}$	100		
		$V_{CE}=-10\text{V}$, $I_C=-150\text{mA}$ (Note 3)	100	300	
		$V_{CE}=-10\text{V}$, $I_C=-500\text{mA}$ (Note 3)	50		
Collector-Emitter saturation voltage (Note 3)	$V_{CE(sat)}$	$I_C=-150\text{mA}$, $I_B=-15\text{mA}$ $I_C=-500\text{mA}$, $I_B=-50\text{mA}$		-0.4 -1.6	V
Base-Emitter saturation voltage	$V_{BE(sat)}$	$I_C=-150\text{mA}$, $I_B=-15\text{mA}$ $I_C=-500\text{mA}$, $I_B=-50\text{mA}$		-1.3 -2.6	V

SMALL-SIGNAL CHARACTERISTICS

Parameter	Symbol	Conditions	Min.	Max.	Unit
Current-Gain-Bandwidth Product (Note 4)	f_T	$V_{CE}=-20\text{V}$, $I_C=-50\text{mA}$ $f=100\text{MHz}$	200		MHz
Output Capacitance	C_{obo}	$V_{CB}=-10\text{V}$, $I_E=0$, $f=1.0\text{MHz}$		8	pF
Input Capacitance	C_{ibo}	$V_{EB}=-2.0\text{V}$, $I_C=0$, $f=1.0\text{MHz}$		30	pF

SWITCHING CHARACTERISTICS

Turn-On time	t_{on}	$V_{CC}=-30V, I_C=-150mA,$ $I_{B1}=-15mA$		45	nS
Delay time	t_d			10	
Rise time	t_r			40	
Storage time	t_s	$V_{CC}=-6V, I_C=-150mA$ $I_{B1}=-I_{B2}=-15mA$		225	
Fall time	t_f			60	
Turn-off time	t_{off}			280	

Notes:

1. Pulse test: Pulse Width < 300 μ s, Duty Cycle < 2.0%.
2. f_T is defined as the frequency at which hFE extrapolates to unity.

Rating and Characteristic Curves

Fig.1 - DC Current Gain

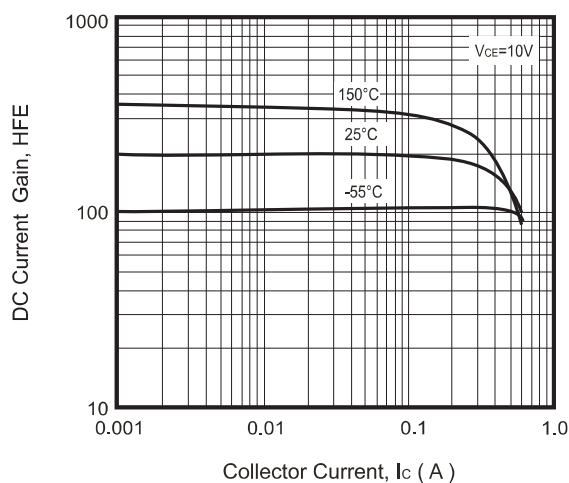


Fig.2 - Collector Saturation Region

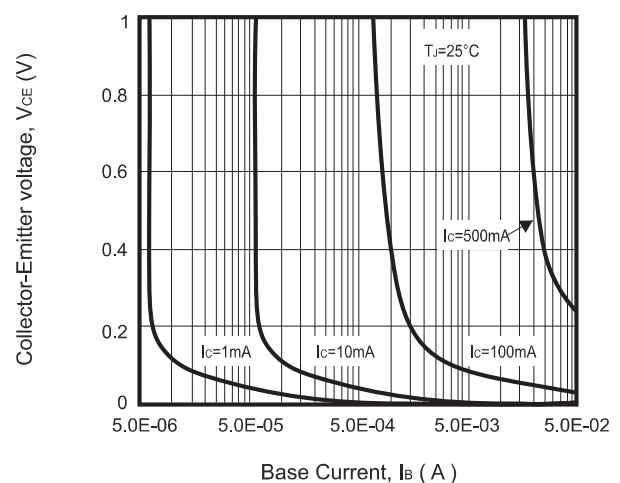


Fig.3 - Collector Emitter Saturation Voltage vs. Collector Current

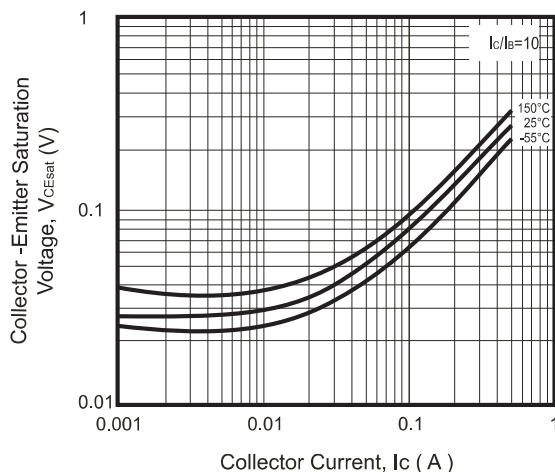
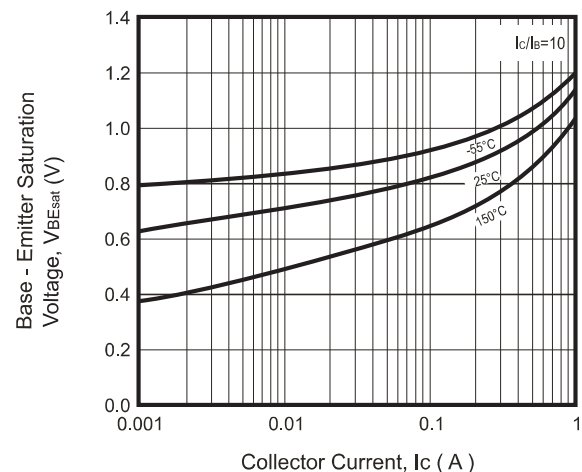


Fig.4 - Base Emitter Saturation Voltage vs. Collector Current



Rating and Characteristic Curves

Fig.5 - Base Emitter Voltage vs. Collector Current

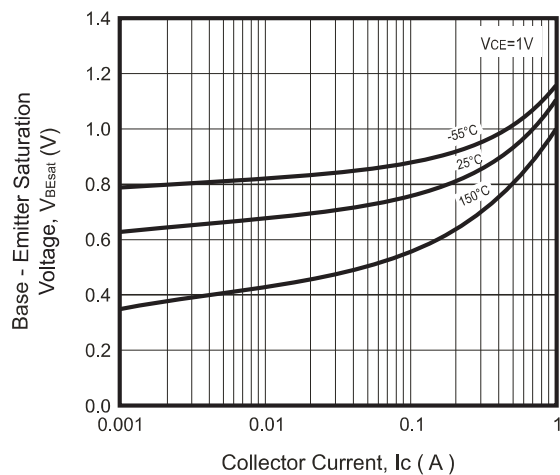


Fig.6 - Capacitance

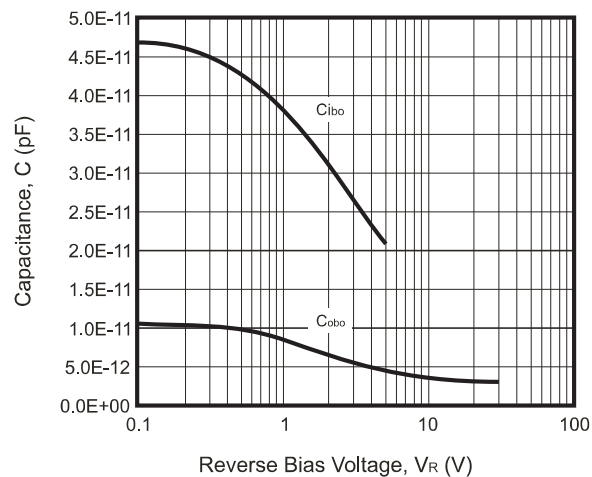
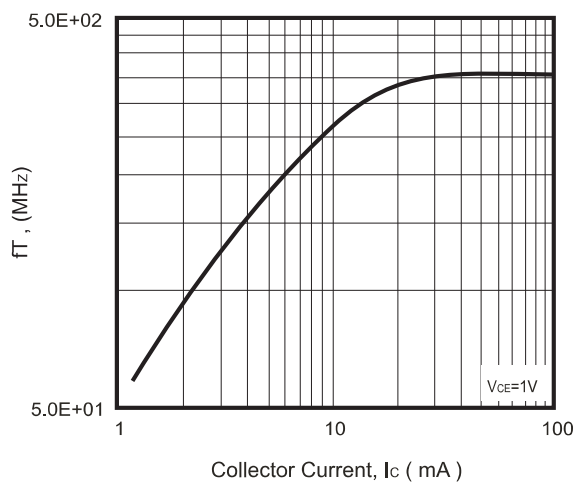
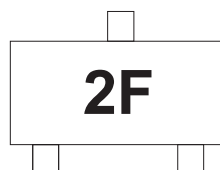


Fig.7 - Current-Gain Bandwidth Product



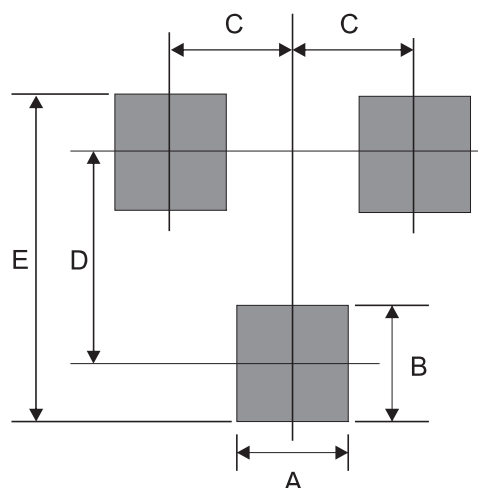
Marking Code

Part Number	Marking Code
MMBT2907A	2F



Suggested PAD Layout

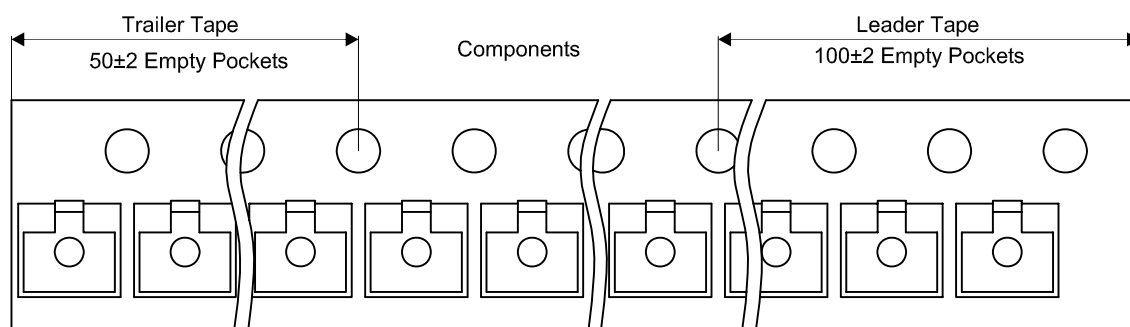
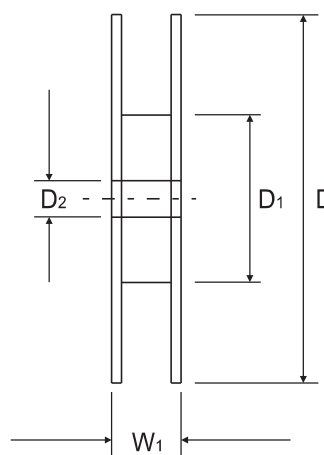
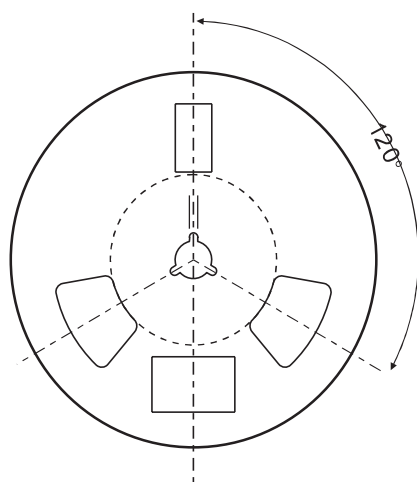
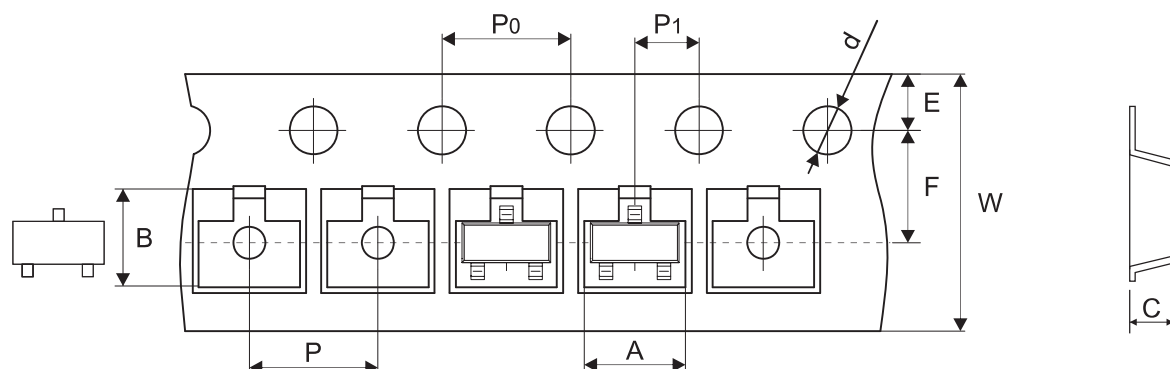
SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	0.90	0.035
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7

Reel Taping Specification



SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	$1.50 + 0.10 - 0.00$	178.00 ± 1.00	54.60 ± 1.00	13.30 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	$0.059 + 0.004 - 0.000$	7.008 ± 0.039	2.150 ± 0.039	0.524 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	$8.00 + 0.30 - 0.10$	11.10 ± 0.20
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	$0.315 + 0.012 - 0.004$	0.437 ± 0.008

Company reserves the right to improve product design , functions and reliability without notice.

Rev:1.0