DATA SHEET

MMBT2222A

GENERAL PURPOSE TRANSISTOR NPN

CURRENT **600 mA** **POWER** **300 mW**

FEATURES

- HIGH DC CURRENT GAIN
- EPITAXIAL PLANAR DIE CONSTRUCTION
- COMPLEMENTARY PNP YTPE AVAILABLE MMBT2907/A
- LEAD FREE AND HALOGEN-FREE

MECHANICAL DATA

- CASE：SOT-23
- TERMINAL：SOLDERABLE PER MIL-STD-220G, METHOD 208
- APPROX. WEIGHT:0.008 GRAMS

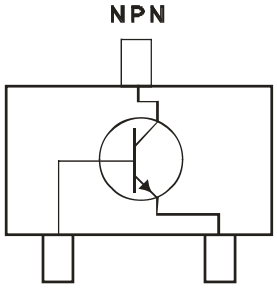
CASE：SOT-23

MAXIMUM RATINGS

RATINGS AT 25°C AMBIENT TEMPERATURE UNLESS OTHERWISE SPECIFIED.			
PARAMETER	SYMBOL	VALUE	UNITS
COLLECTOR-EMITTER VOLTAGE	V_{CEO}	40	V
COLLECTOR-BASE VOLTAGE	V_{CBO}	75	V
EMITTER-BASE VOLTAGE	V_{EBO}	6	V
COLLECTOR CURRENT-CONTINUOUS	I_C	600	mA
POWER DISSIPATION @ $T_A = 25^\circ C$	P_D	300	mW
OPERATING AND STORAGE JUNCTION TEMPERATURE RANGE	T_J ; T_{STG}	-55 TO +150	°C

NOTE:

1. INDICATES DATA IN ADDITION TO JEDEC REQUIREMENTS.



ELECTRICAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS (AT T_A = 25˚C UNLESS OTHERWISE NOTED)					
CHARACTERISTIC	TEST CONDITIONS	SYMBOL	MIN.	MAX.	UNITS
OFF CHARACTERISTICS					
COLLECTOR-EMITTER BREAKDOWN VOLTAGE (Note.1)	I_C=10mA, I_B=0	$V_{(BR)CEO}$	40	-	V
COLLECTOR-BASE BREAKDOWN VOLTAGE	I_C=10μA, I_E=0	$V_{(BR)CBO}$	75	-	V
EMITTER-BASE BREAKDOWN VOLTAGE	I_E=10μA, I_C=0	$V_{(BR)EBO}$	6	-	V
COLLECTOR CUT-OFF CURRENT	V_{CB}=50V, I_E=0	I_{CBO}	-	10	nA
COLLECTOR CUT-OFF CURRENT	V_{CE}=60V, V_{EB}=3V	I_{CEX}	-	10	nA
EMITTER CUT-OFF CURRENT	V_{EB}=3V, I_C=0	I_{EBO}	-	10	nA
ON CHARACTERISTICS					
DC CURRENT GAIN	I_C=0.1mA,V_{CE}=10V	h_{FE}	35	-	-
	I_C=1.0mA,V_{CE}=10V		50	-	
	I_C=10mA,V_{CE}=10V		75	-	
	I_C=150mA,V_{CE}=10V		100	300	
	I_C=150mA,V_{CE}=1.0V		50	-	
	I_C=500mA,V_{CE}=10V		40	-	
COLLECTOR-EMITTER SATURATION VOLTAGE	I_C=150mA, I_B=15mA	$V_{CE(SAT)}$	-	0.3	V
	I_C=500mA, I_B=50mA		-	1	
BASE-EMITTER SATURATION VOLTAGE	I_C=150mA, I_B=15mA	$V_{BE(SAT)}$	-	1.2	V
	I_C=500mA, I_B=50mA		-	2	
SMALL-SIGNAL CHARACTERISTICS					
INPUT BASE CAPACITANCE	V_{EB}=0.5V, I_C=0, f = 1.0MHz	Cib	-	25	pF
OUTPUT BASE CAPACITANCE	V_{CB}=10V, I_E=0, f = 1.0MHz	Cob	-	8	pF
NOISE FIGURE	I_C=0.1mA, V_{CE}=10V, f =1KHz ,R_S=2KΩ	NF	-	10	dB
CURRENT-GAIN-BANDWIDTH PRODUCT	I_C=20mA, V_{CE}=20V, f = 100MHz	f_T	300	-	MHz
SWITCHING CHARACTERISTICS					
DELAY TIME	V_{CC}=30V, $V_{BE(OFF)}$= -0.5V, I_C=150mA, I_{B1}=15mA	t_d	-	10	ns
RISE TIME		t_r	-	25	ns
STORAGE TIME	V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA	t_s	-	225	ns
FALL TIME		t_f	-	65	ns

NOTE:

1. PULSE TEST: PULSE WIDTH ≤ 300μs; DUTY CYCLE ≤ 2%

ELECTRICAL CHARACTERISTICS CURVE

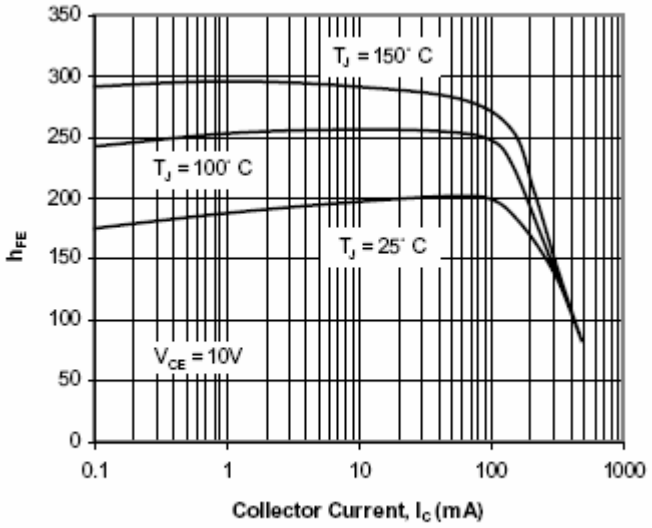


Fig. 1. Typical h_{FE} vs Collector Current

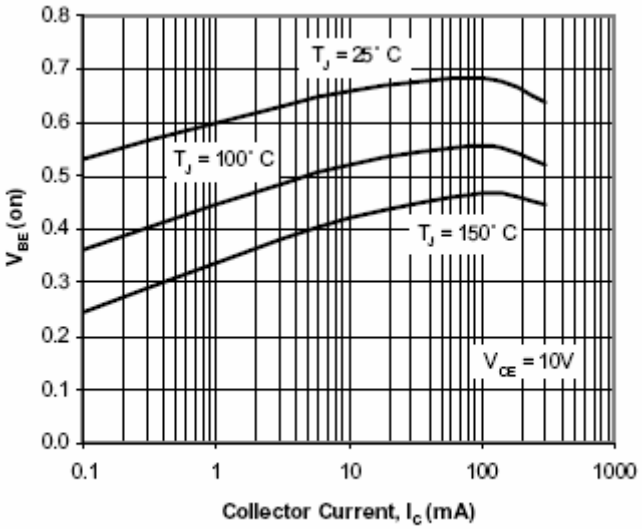


Fig. 2. Typical V_{BE} vs Collector Current

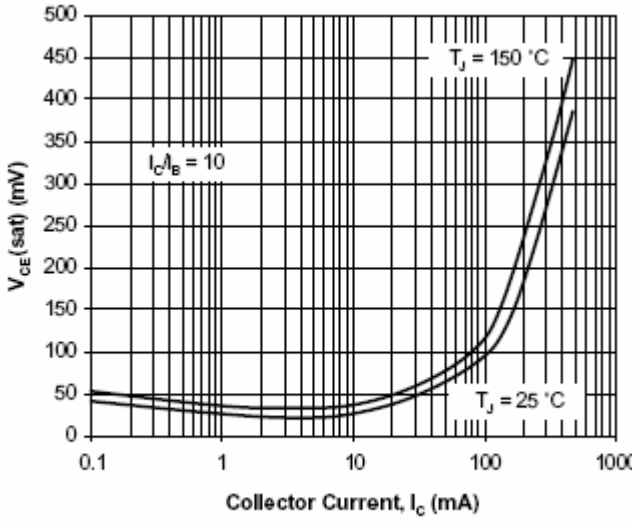


Fig. 3. Typical V_{CE} (sat) vs Collector Curre

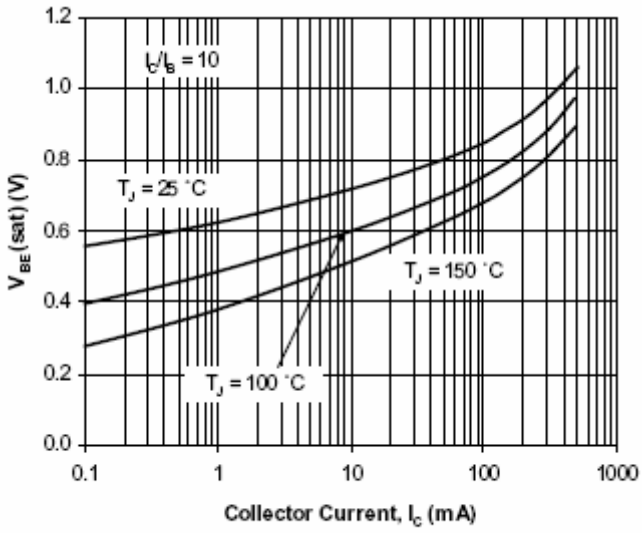


Fig. 4. Typical V_{BE} (sat) vs Collector Current

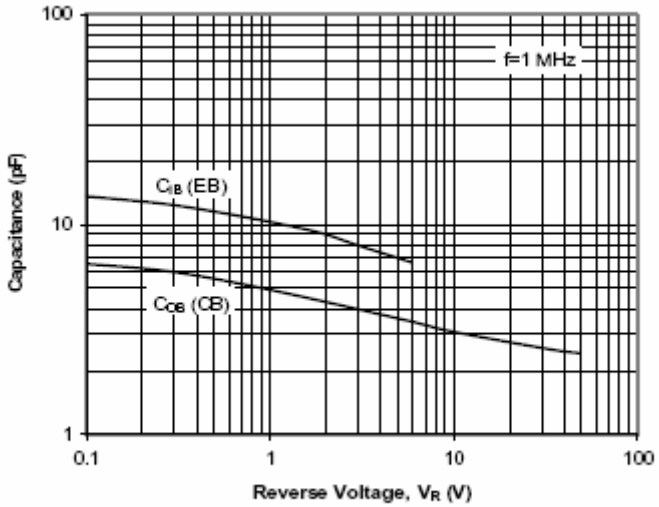
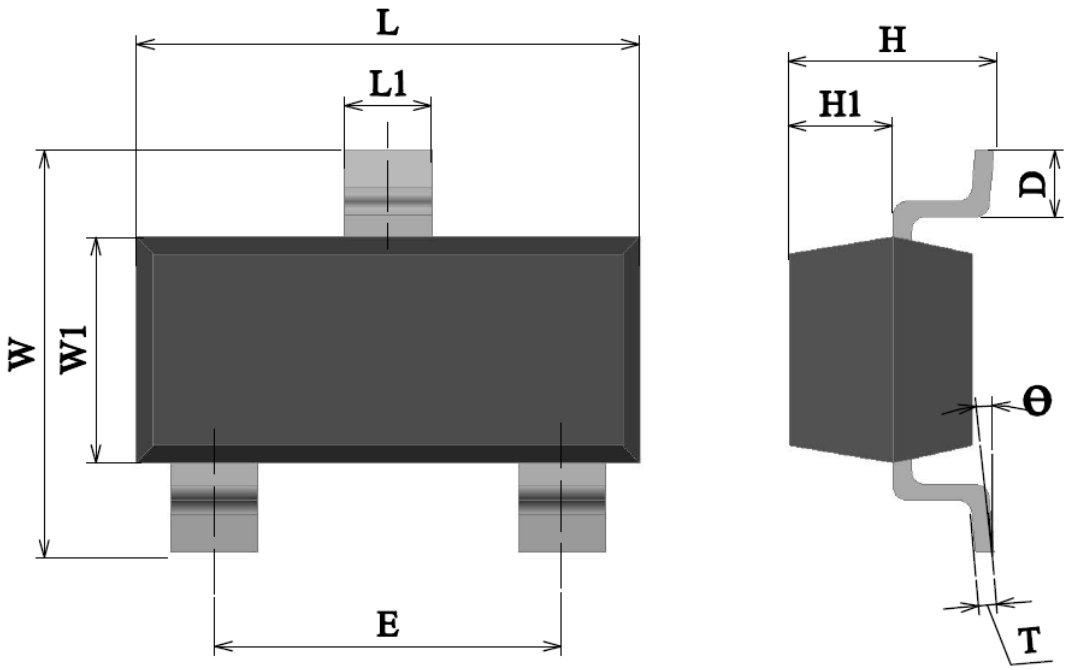


Fig. 5. Typical Capacitances vs Reverse Voltage

SOT-23 DIMENSION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
L	2.80	3.10	0.110	0.122
L1	0.30	0.50	0.012	0.020
W	2.25	2.54	0.089	0.100
W1	1.20	1.40	0.047	0.055
E	1.80	2.00	0.071	0.079
H	0.90	1.15	0.035	0.045
H1	0.40	0.80	0.016	0.031
D	0.30	0.50	0.012	0.020
T	0.08	0.15	0.003	0.006
θ	0°	8°	0 °	8°