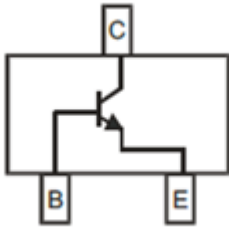


NPN General Purpose Amplifier



SOT-23

Features

- Epoxy meets UL-94 V-0 flammability rating and halogen free
- Moisture Sensitivity Level 1
- High Conductance
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Switching and linear amplification

Mechanical Data

- Case: SOT-23
- Terminals: Tin plated leads, solderable per J-STD-002 and JESD22-B102
- Marking: 1P

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

Item	Symbol	Unit	Value
Collector-Base Voltage	V_{CBO}	V	75
Collector-Emitter Voltage	V_{CEO}	V	40
Emitter-Base Voltage	V_{EBO}	V	6
Collector Current -Continuous	I_C	mA	600
Total Device Dissipation (*)	P_D	mW	300
Thermal Resistance Junction to Ambient (*)	R_{thJA}	K/W	417
Junction Temperature	T_j	°C	-55 to +150
Storage Temperature	T_{STG}	°C	-55 to +150

(*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch.



■ Electrical Characteristics (Ta=25°C unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C=10\mu A, I_E=0$	75		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C=10mA, I_B=0$	40		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E=10\mu A, I_C=0$	6		
Collector cut-off current	I_{CEX}	nA	$V_{CE}=60V, V_{BE}=3V$			10
Base cut-off current	I_{CBO}	nA	$V_{CB}=60V, I_E=0$			100
Emitter cut-off current	I_{EBO}	nA	$V_{EB}=3V, I_C=0$			100
DC current gain	h_{FE}		$V_{CE}=10V, I_C=0.1mA$	35		
	h_{FE}		$V_{CE}=10V, I_C=1mA$	50		
	h_{FE}		$V_{CE}=10V, I_C=10mA$	75		
	h_{FE}		$V_{CE}=10V, I_C=150mA$	100		300
	h_{FE}		$V_{CE}=10V, I_C=500mA$	40		
	h_{FE}		$V_{CE}=1V, I_C=150mA$	50		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=150mA, I_B=15mA$			0.3
	$V_{CE(sat)}$	V	$I_C=500mA, I_B=50mA$			1.0
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=150mA, I_B=15mA$	0.6		1.2
	$V_{BE(sat)}$	V	$I_C=500mA, I_B=50mA$			2.0
Transition frequency	f_T	MHz	$V_{CE}=20V, I_C=20mA, f=100MHz$	300		
Delay time	t_d	ns	$V_{CC}=30V, V_{BE(off)}=-0.5V$ $I_C=150mA, I_{B1}=15mA$			10
Rise time	t_r	ns				25
Storage time	t_s	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$			225
Fall time	t_f	ns				60

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMBT2222AQ	F2	Approximate 0.01	3000	30000	120000	7" reel



■ Characteristics (Typical)

Fig.1-Static Characteristic

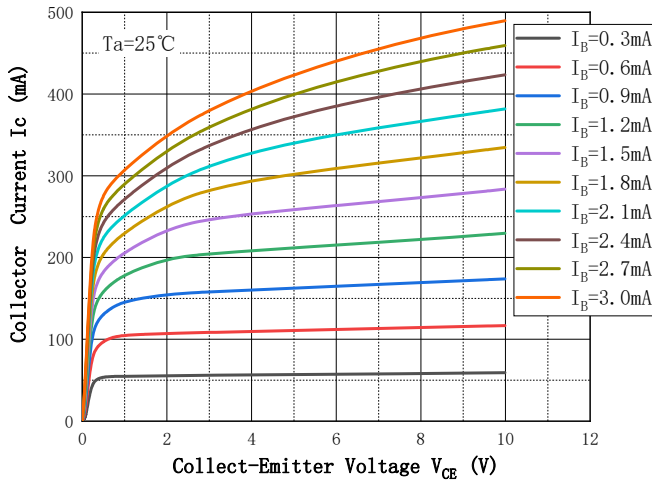


Fig.2 - DC Current Gain

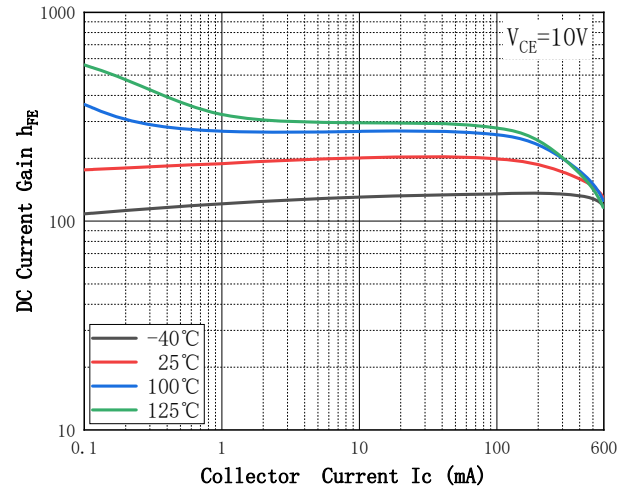


Fig.3 - Collect-Emmitter Saturation Voltage

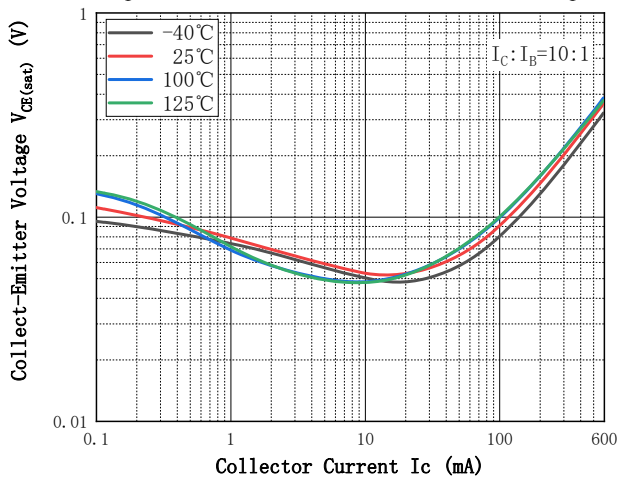


Fig.4 - Base-Emmitter Voltage

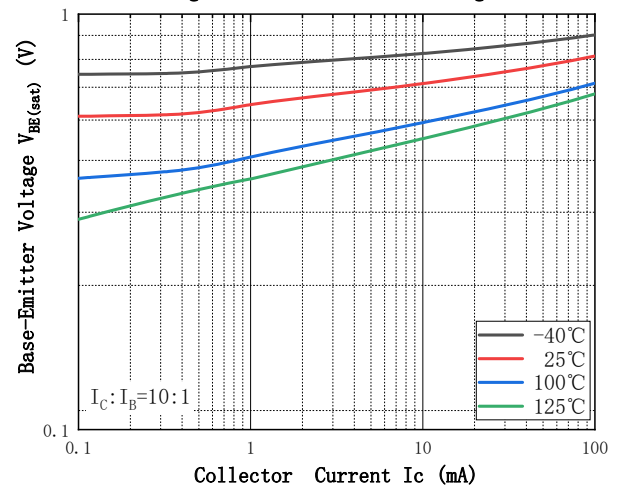


Fig.5 - Base-Emmitter On Voltage

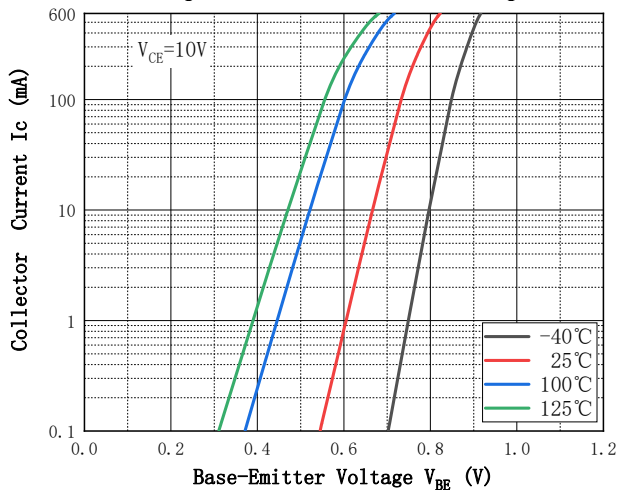
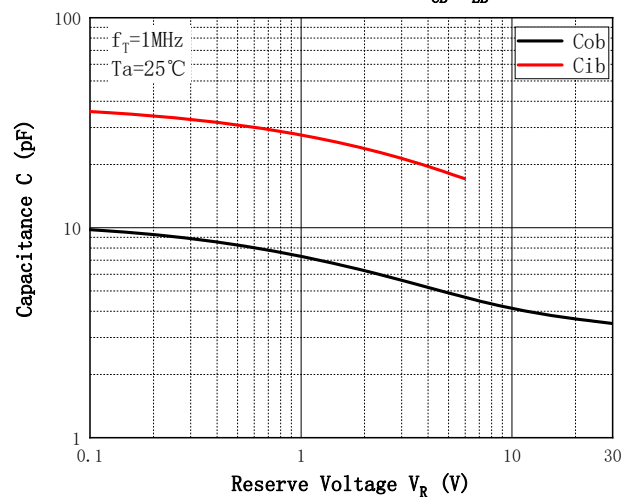
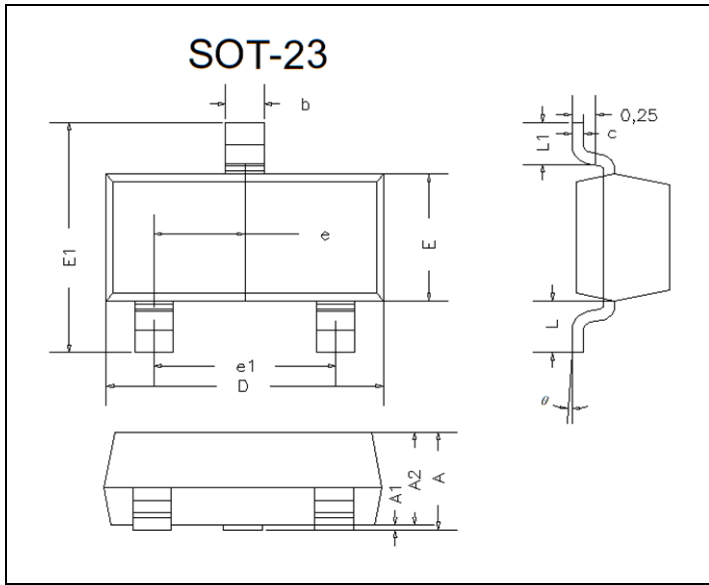


Fig.6 - Cob/Cib— V_{CE}/V_{EB}

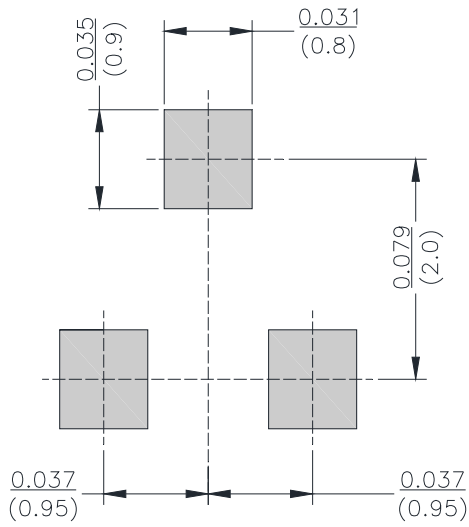


■ SOT-23 Package Outline Dimensions



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	0.045	0.90	1.15	
A1	0.000	0.004	0.00	0.10	
A2	0.035	0.041	0.90	1.05	
b	0.012	0.020	0.30	0.50	
c	0.004	0.008	0.10	0.20	
D	0.110	0.118	2.80	3.00	
E	0.047	0.055	1.20	1.40	
E1	0.089	0.100	2.25	2.55	
e	0.370TYP		0.95TYP		
e1	0.071	0.079	1.80	2.00	
L	0.220REF		0.55REF		
L1	0.012	0.020	0.30	0.50	
θ	0°	8°	0°	8°	

■ SOT-23 Suggested Pad Layout



Unit: $\frac{\text{inch}}{\text{mm}}$



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