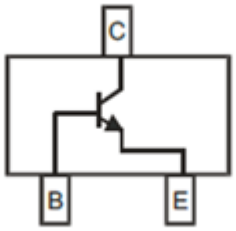
NPN General Purpose Amplifier



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℃ 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
Junction Temperature	T_j	℃	-55 to +150
Storage Temperature	T_{STG}	℃	-55 to +150

■ Electrical Characteristics (Ta=25℃ unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	I_C=10uA,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=10μA,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_{CE}=60V, I_C =0			100
Emitter cut-off current	I_{EBO}	nA	V_{EB}=3 V, 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	td	ns	V_{CC}=30V, $V_{BE(off)}$=-0.5V I_C=150mA,I_{B1}=15mA			10
Rise time	tr	ns				25
Storage time	ts	ns	V_{CC}=30V,I_C=150mA,I_{B1}=I_{B2}=15mA			225
Fall time	tf	ns				60

■ Ordering Information (Example)

PREFERED 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)

Figure 1.Static Characteristic

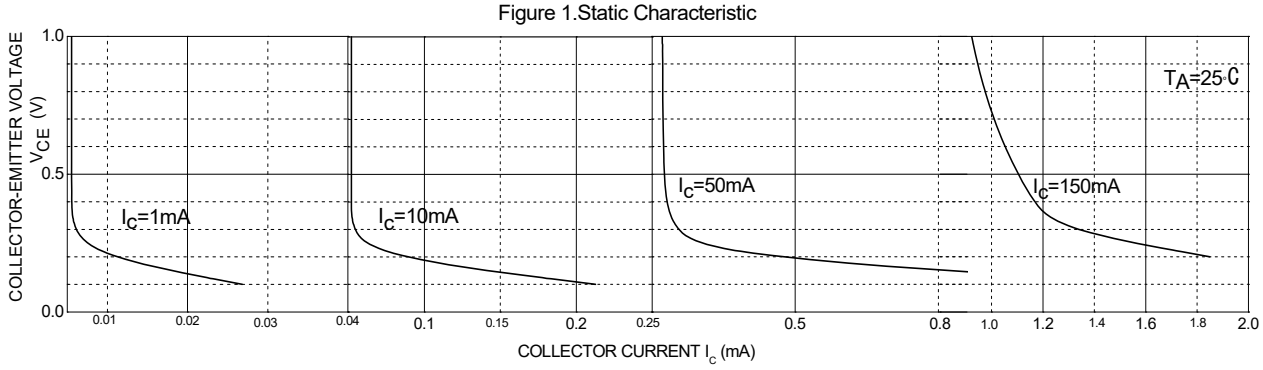


Figure 2. H_{FE} - I_c

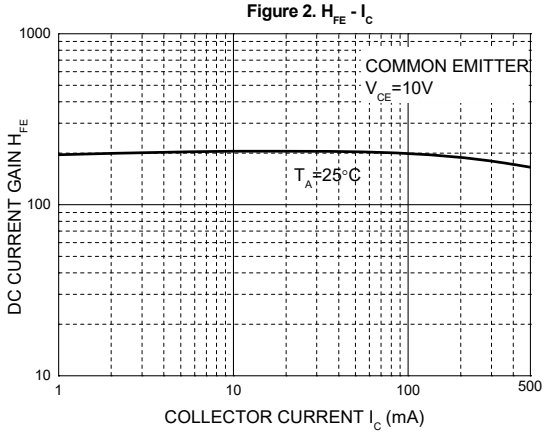


Figure 3. V_{besat} - I_c

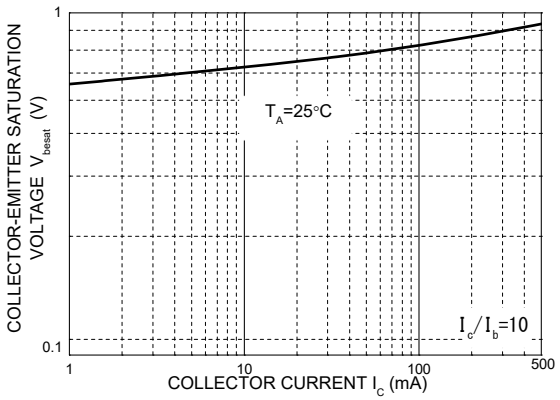
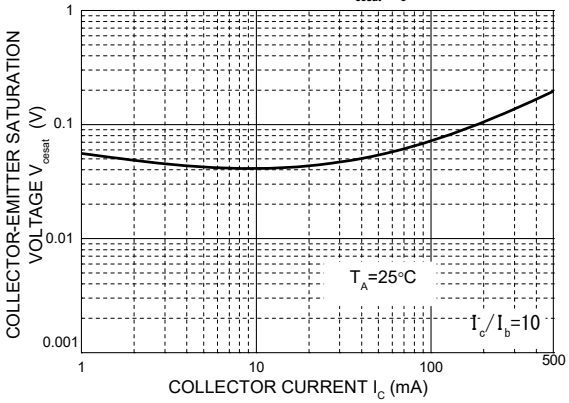
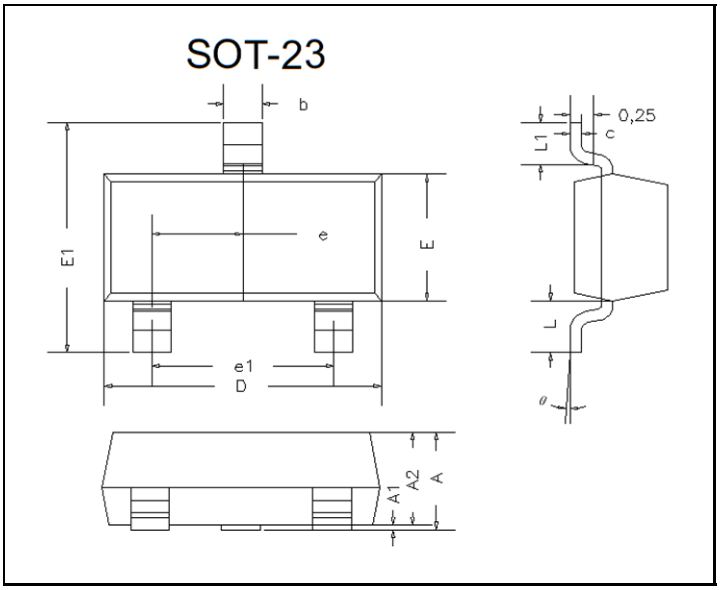


Figure 4. V_{cesat} - I_c

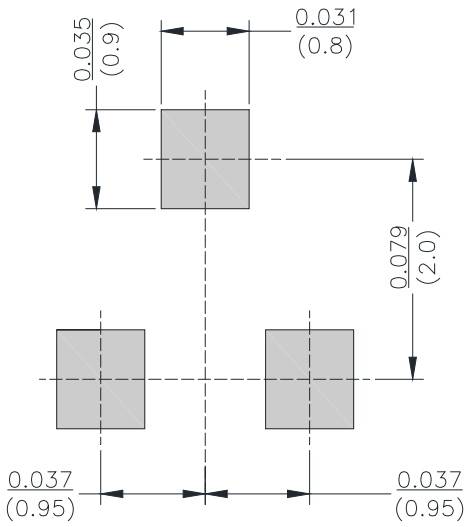


■SOT-23 Package Outline Dimensions



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: inch / mm

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