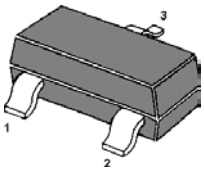
NPN Silicon Epitaxial Planar Transistor

Features

- Halogen and Antimony Free(HAF), RoHS compliant
- AEC-Q101 Qualified
- For switching and amplifier

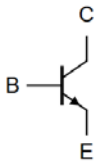


1.Base 2. Emitter 3. Collector

Pb
RoHS
COMPLIANT

Mechanical Data

- SOT-23 Plastic Package
- Mounting position: Any



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)			
Parameter	**Symbol**	**Value**	**Unit**
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Power Dissipation	P_D	350	mW
Operating Junction Temperature Range	T_J	- 55 to + 150	℃
Storage Temperature Range	T_{stg}	- 55 to + 150	℃

Thermal Characteristics			
Parameter	**Symbol**	**Value**	**Unit**
Thermal Resistance Junction to Ambient[1)]	R_{thJA}	357	°C/W

[1)] Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Electrical Characteristics (T_A =25°C unless otherwise noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at V_{CE} = 1 V, I_C = 0.1 mA at V_{CE} = 1 V, I_C = 1 mA at V_{CE} = 1 V, I_C = 10 mA at V_{CE} = 1 V, I_C = 50 mA at V_{CE} = 1 V, I_C = 100 mA	h_{FE}	 40 70 100 60 30	 - - - - -	 - - 300 - -	 - - - - -
Collector Base Cutoff Current at V_{CB} = 30 V	I_{CBO}	-	-	50	nA
Emitter Base Cutoff Current at V_{EB} = 6 V	I_{EBO}	-	-	50	nA
Collector Base Breakdown Voltage at I_C = 10 μA	$V_{(BR)CBO}$	60	-	-	V
Collector Emitter Breakdown Voltage at I_C = 1 mA	$V_{(BR)CEO}$	40	-	-	V
Emitter Base Breakdown Voltage at I_E = 10 μA	$V_{(BR)EBO}$	6	-	-	V
Collector Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA	$V_{CE(sat)}$	- -	- -	0.2 0.3	V
Base Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA	$V_{BE(sat)}$	0.65 -	- -	0.85 0.95	V
Current Gain Bandwidth Product at V_{CE} = 20 V, I_C = 10 mA, f = 100 MHz	f_T	300	-	-	MHz
Collector Output Capacitance at V_{CB} = 5 V, f = 1 MHz	C_{ob}	-	-	4	pF
Delay Time at V_{CC} = 3 V, V_{BE} = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	t_d	-	-	35	ns
Rise Time at V_{CC} = 3 V, V_{BE} = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	t_r	-	-	35	ns
Storage Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = -I_{B2} = 1 mA	t_s	-	-	200	ns
Fall Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = -I_{B2} = 1 mA	t_f	-	-	50	ns

Typical Characteristics Curves (TA = 25°C unless otherwise noted)

Fig. 1 Output Characteristics Curve

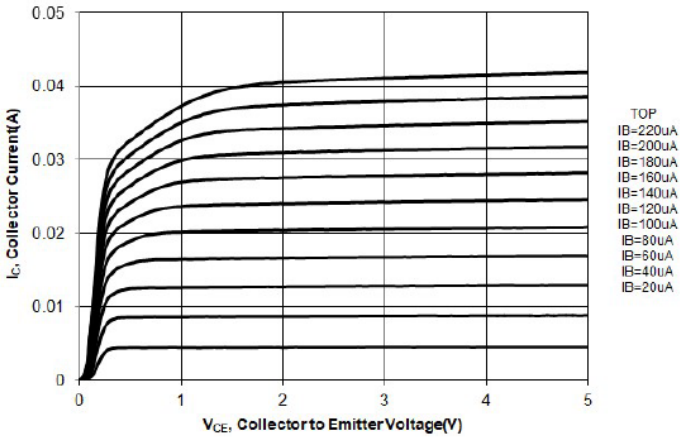


Fig. 2 Collector Current vs. Base to Emitter Voltage

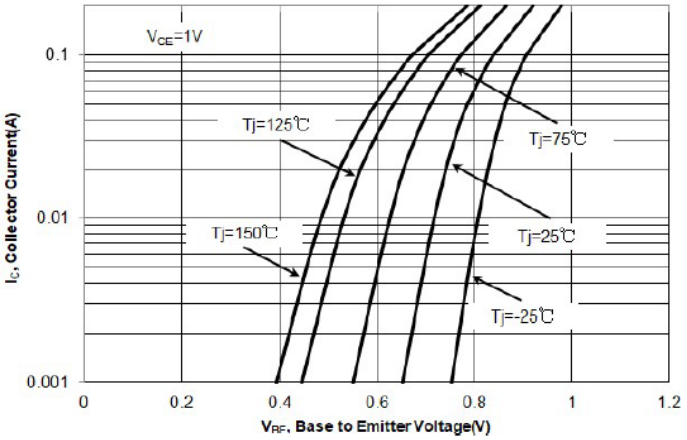


Fig. 3 DC Current Gain vs. Collector Current

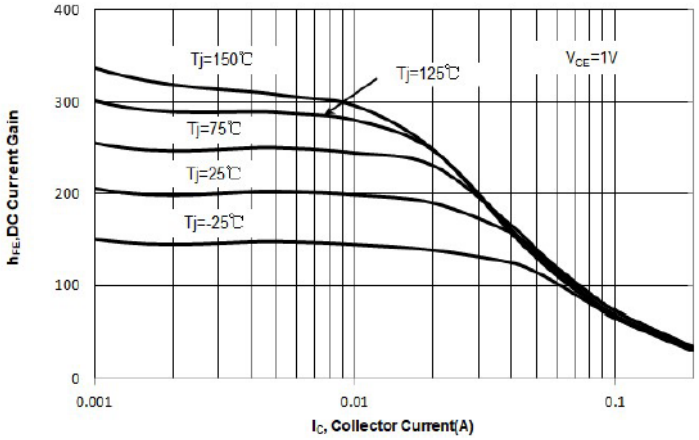


Fig. 4 $V_{BE(sat)}$ vs. Collector Current

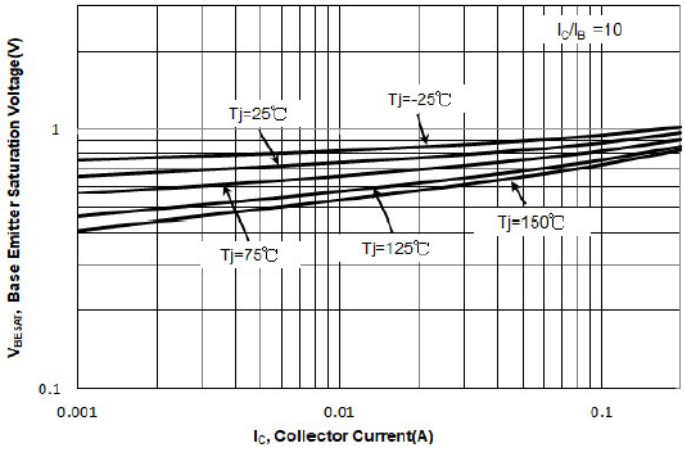


Fig. 5 $V_{CE(sat)}$ vs. Collector Current

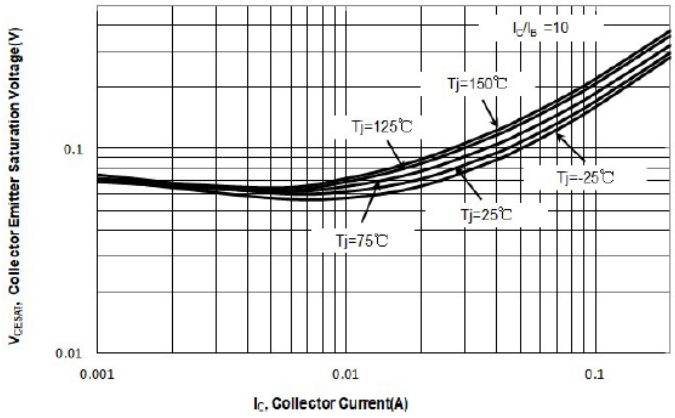


Fig. 6 Output Capacitance

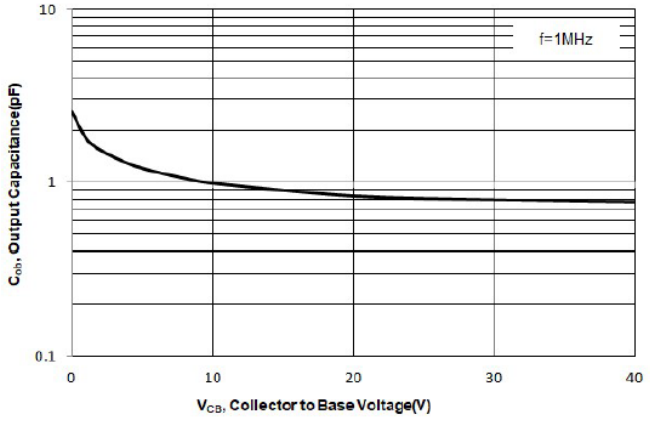
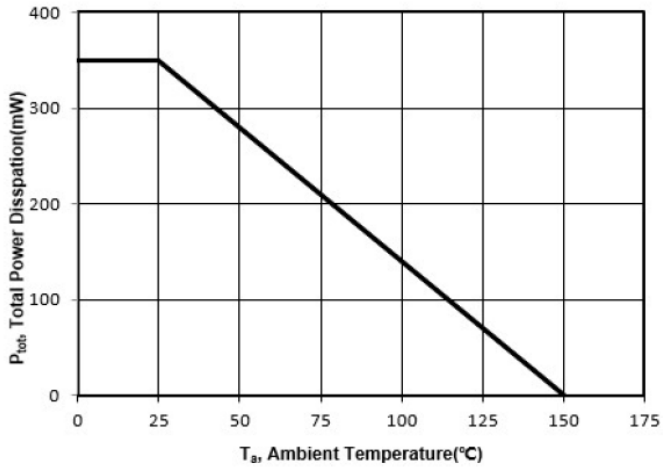
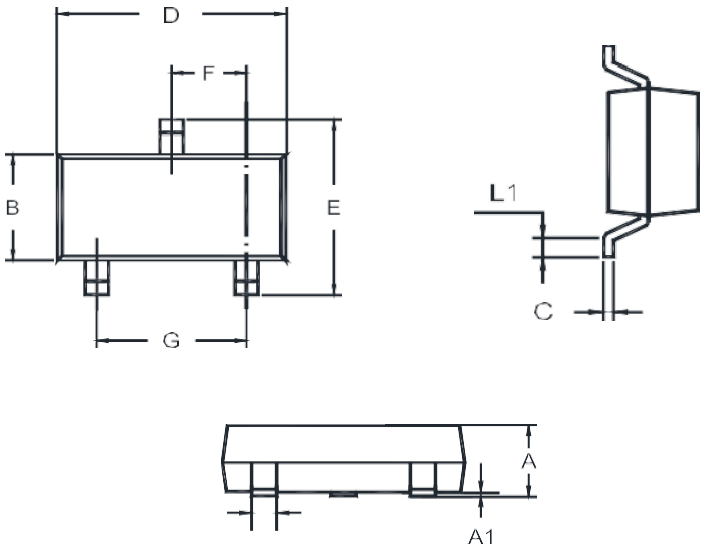


Fig. 7 Power Derating Curve



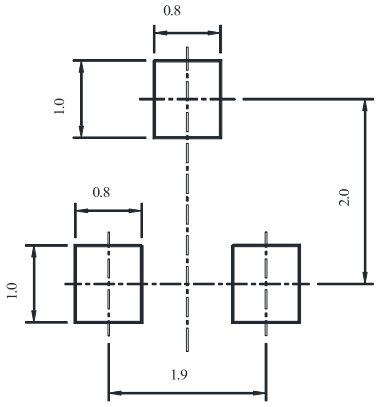
Package Outline Dimensions (Unit: millimeters)

SOT-23



SYMBOL	MILLIMETER		
	MIN	TYP	MAX
A	0.89	/	1.2
A1	0.013	/	0.1
B	1.2	/	1.4
C	0.08	/	0.19
D	2.8	/	3.04
E	2.2	/	2.6
F	0.89	/	1.02
G	1.78	/	2.04
L	0.37	/	0.51
L1	/	/	0.2

Recommended Soldering Footprint (Unit: millimeters)



Packing Information

Package	Tape Width	Pitch		Reel Size		Per Reel Packing Quantity
SOT-23	mm	mm	inch	mm	inch	
	8	4±0.1	0.157±0.004	178	7	3000

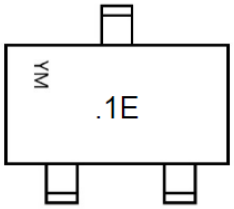
Marking information

" 1E " = Part No. (See table of Marking information)

" YM " = Date Code Marking

" • " = Automotive-grade material

Font type: Arial



Revision History

Version	Date	Major Changes
Rev.A	2025.01.19	Official Release

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