NPN TRANSISTOR

FEATURES

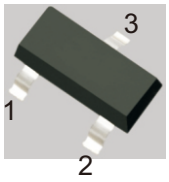
- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation
- We declare that the material of product compliance with RoHS requirements
- Qualified to AEC-Q101 Standards for High Reliability

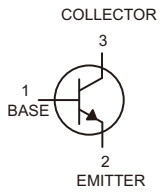
APPLICATIONS

- Supply line switching circuits
- Battery management applications
- DC/DC converter applications
- Strobe flash units
- Heavy duty battery powered equipment (motor and lamp drivers)

PINNING

PIN	DESCRIPTION
1	BASE
2	EMITTER
3	COLLECTOR





Simplified outline SOT-23 and symbol

Automotive Grade

MAXIMUM RATINGS (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector–Base Voltage	V_{CBO}	40	V
Collector–Emitter Voltage	V_{CEO}	40	V
Emitter–Base Voltage	V_{EBO}	5.0	V
Collector Current — Continuous	I_C	2	A
Collector Power Dissipation	P_C	300	mW
Junction temperature	T_J	150	℃
Storage Temperature	T_{stg}	-65~+150	℃

THERMAL CHARACTERISTICS

Symbol	Parameter	Conditions	Value	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air;note 1	417	K/W
		in free air;note 2	260	K/W

Notes:
1.Device mounted on a printed-circuit board,single sided copper,tinplated and standard footprint.
2.Device mounted on a printed-circuit board,single sided copper,tinplated and mounted pad for collector 1 cm.

ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted)

Parameter	Symbol	Test conditions	Min	Max	Typ	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C = 100uA, I_E = 0	40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 1 mA, I_B = 0	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E = 100uA, I_C = 0	5.0			V
Collector cut-o ffcurrent	I_{CBO}	V_{CB} = 30V, I_E = 0		100		nA
Emitter cut-o ffcurrent	I_{EBO}	V_{EB} = 4V, I_C = 0		100		nA
DC current gain	h_{FE}	V_{CE} = 2V, I_C = 100mA	350			
		V_{CE} = 2V, I_C = 500mA	300			
		V_{CE} = 2V, I_C = 1A	300			
		V_{CE} = 2V, I_C = 2A	150			
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 100mA, I_B = 1mA		70		mV
		I_C = 500mA, I_B = 50mA		100		mV
		I_C = 750mA, I_B = 15mA		180		mV
		I_C = 1A, I_B = 50mA,note 1		180		mV
		I_C = 2A, I_B = 200mA,note 1		320		mV
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C = 2A, I_B =200mA,note 1		1.1		V
base-emitter turn on voltage	$V_{BE(on)}$	I_C = 100mA, V_{CE} =2V		0.75		V
collector capacitance	C_C	I_E=I_e=0,V_{CB} = 10V, f =1MHz		20		pF
Transition frequency	f_T	V_{CE} = 10V, I_C = 100mA,f =100MHz	100			MHz

Note1: Pulse test: tp≤300μs，δ≤0.02

TYPICAL CHARACTERICS

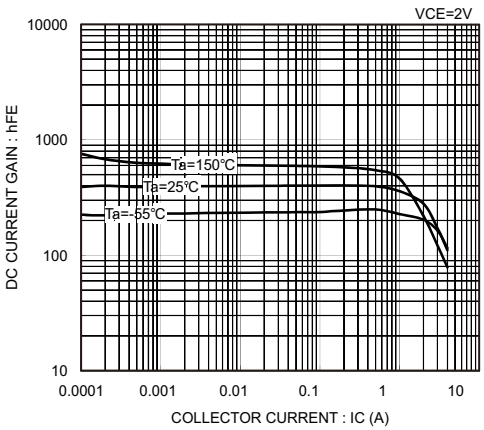


Fig.1 DC CURRENT GAIN VS.COLLECTOR CURRENT

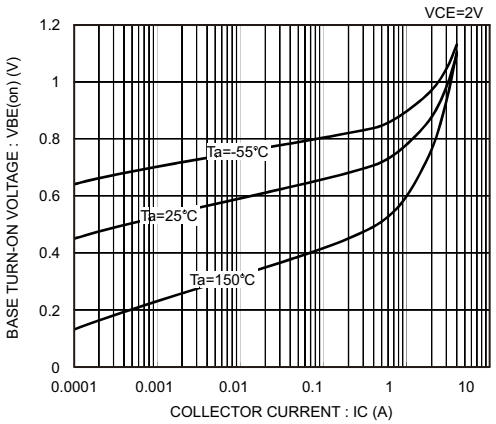


Fig.2 BASE-EMITTER TURN-ON VOLTAGE VS.COLLECTOR CURRENT

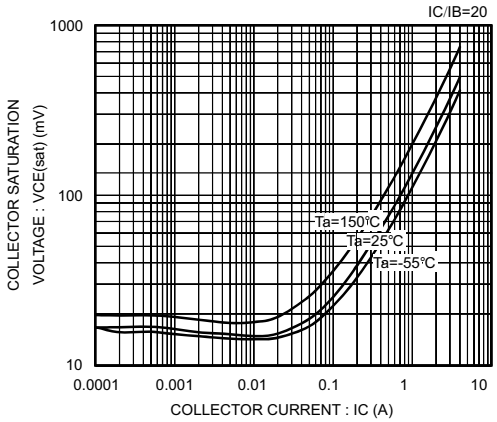


Fig.3 COLLECTOR-EMITTER SATURATION VOLTAGE VS.COLLECTOR CURRENT

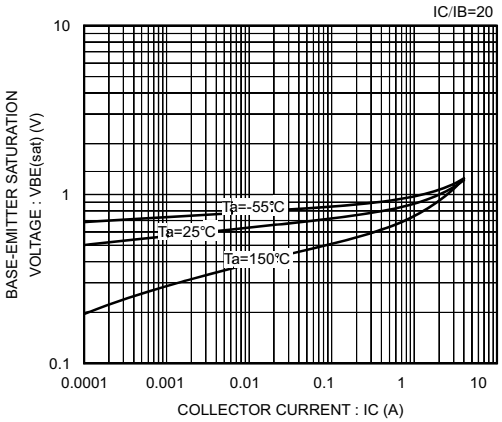


Fig.4 BASE-EMITTER SATURATION VOLTAGE VS.COLLECTOR CURRENT

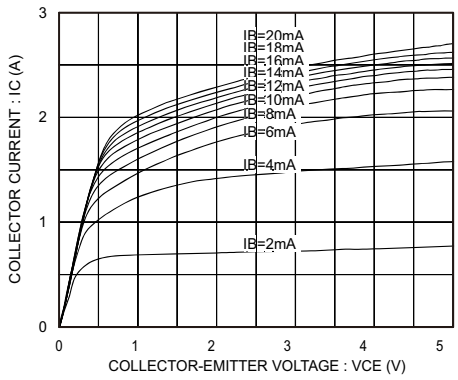


Fig.5 COLLECTOR CURRENT VS.COLLECTOR-EMITTER SATURATION VOLTAGE

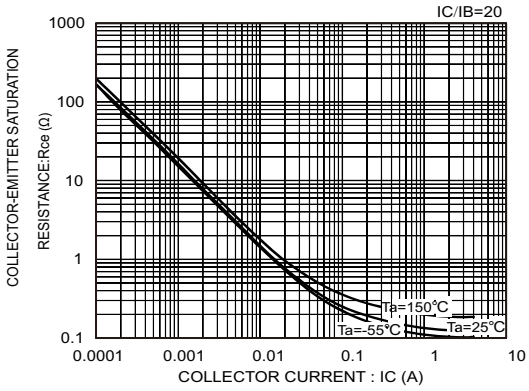
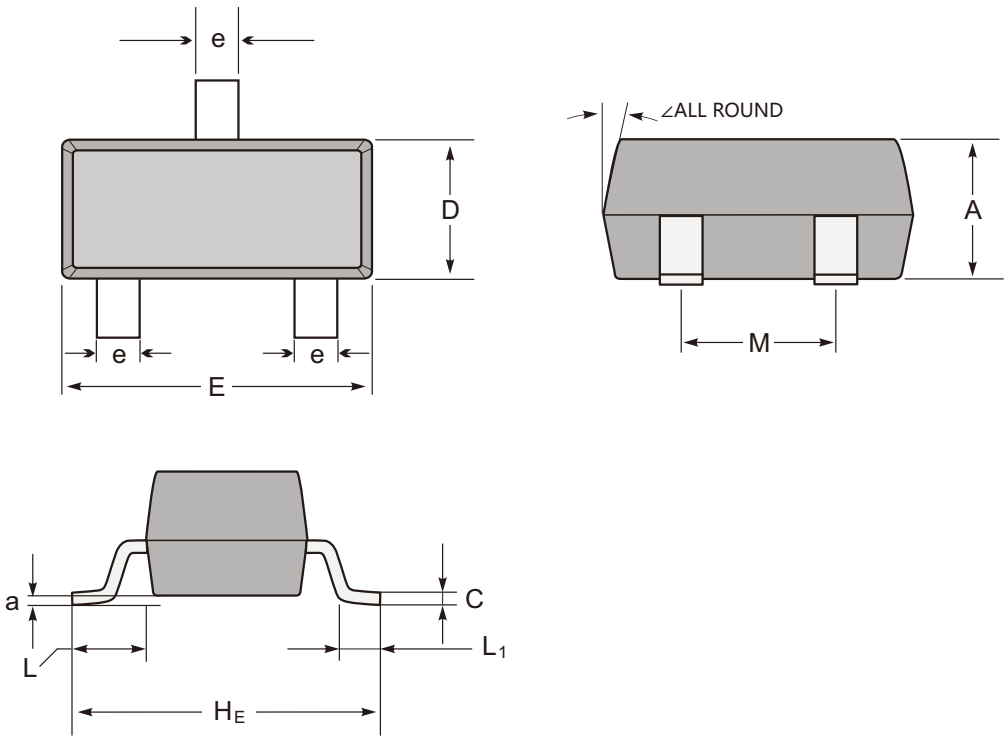


Fig.6 COLLECTOR-EMITTER SATURATION RESISTANCE VS.COLLECTOR CURRENT

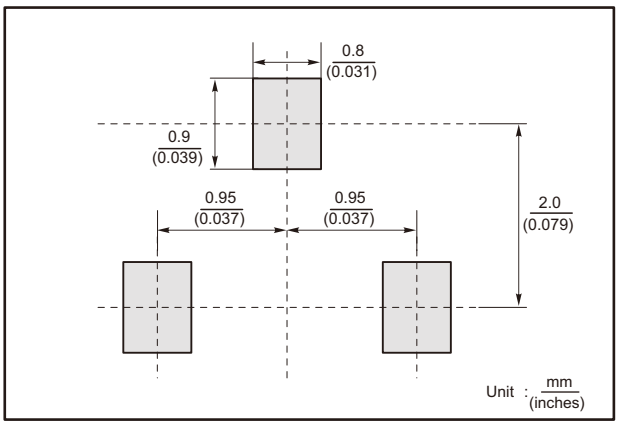
SOT-23 Package Outline Dimensions



SOT-23 mechanical data

UNIT		A	C	D	E	H_E	e	M	L	L_1	a	∠
mm	max	1.1	0.20	1.4	3.0	2.6	0.6	1.95	0.55 (ref)	0.36 (ref)	0.15	12°
	min	0.9	0.08	1.2	2.8	2.2	0.35	1.7			0.0	
mil	max	43	7.9	55	118	102	24	77	22 (ref)	14 (ref)	6	
	min	35	3.1	47	110	87	13	67			0.0	

The recommended mounting pad size



Marking

Type number	Marking code
MMBT4240WD	ZE

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