

TRANSISTOR(NPN)

FEATURES

Switching transistor

MARKING : 2X

MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	meter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	600	m A
P_C	Collector Power dissipation	0.3	W
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance, junction to Ambient	417	$^{\circ}\text{C}/\text{mW}$

SOT-23



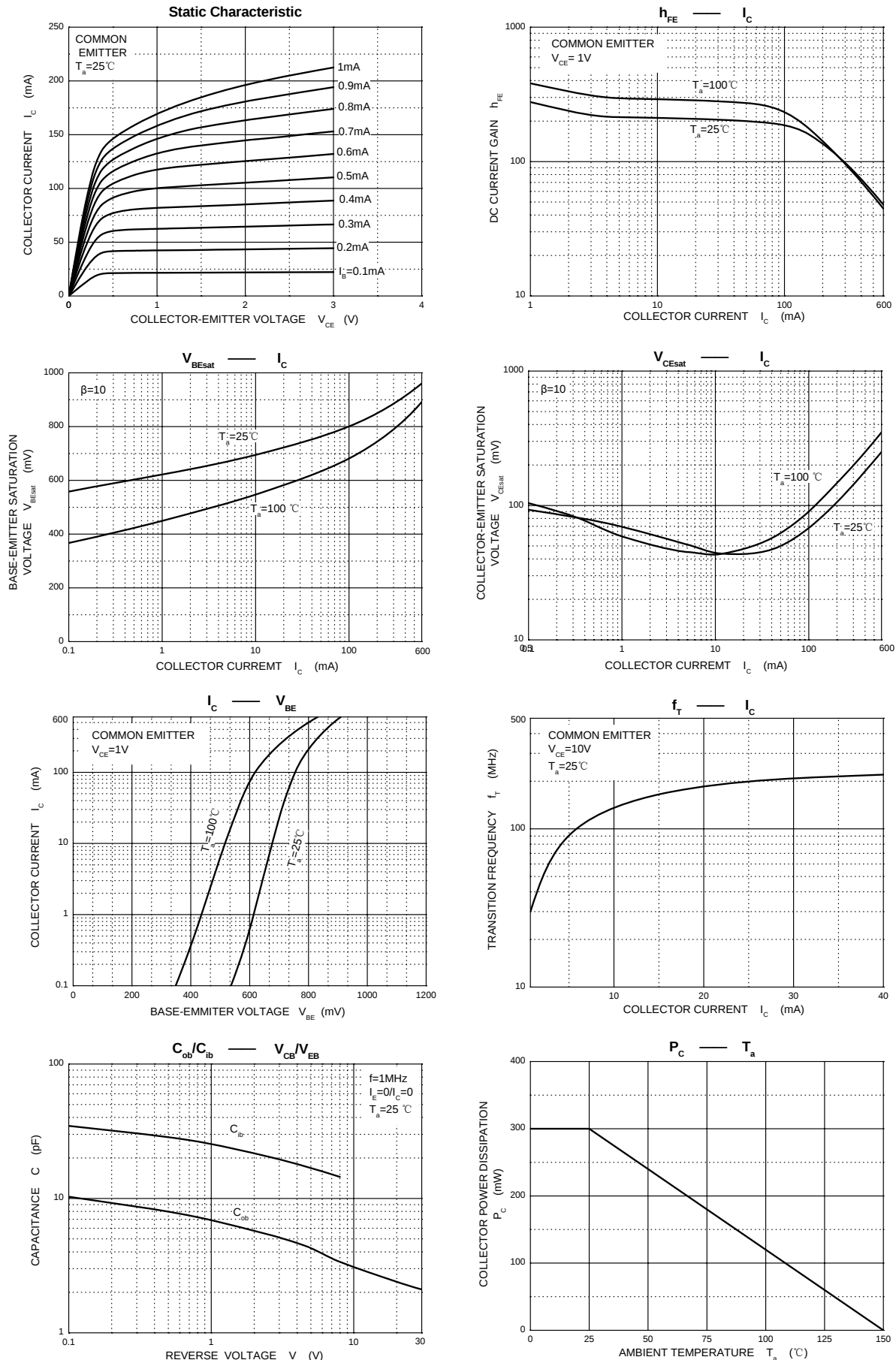
1. BASE
2. EMITTER
3. COLLECTOR

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$, $I_B = 0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}$, $I_C = 0$	6			V
Collector cut-off current	I_{CBO}	$V_{CB} = 50\text{V}$, $I_E = 0$			0.1	μA
Collector cut-off current	I_{CEX}	$V_{CE} = 35\text{V}$, $V_{EB} = 0.4\text{V}$			0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5\text{V}$, $I_C = 0$			0.1	μA
DC current gain	h_{FE1}	$V_{CE} = 1\text{V}$, $I_C = 0.1\text{mA}$	20			
	h_{FE2}	$V_{CE} = 1\text{V}$, $I_C = 1\text{mA}$	40			
	h_{FE3}	$V_{CE} = 1\text{V}$, $I_C = 10\text{mA}$	80			
	h_{FE4}	$V_{CE} = 1\text{V}$, $I_C = 150\text{mA}$	100		300	
	h_{FE5}	$V_{CE} = 2\text{V}$, $I_C = 500\text{mA}$	40			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$			0.4	V
		$I_C = 500\text{mA}$, $I_B = 50\text{mA}$			0.75	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$			0.95	V
		$I_C = 500\text{mA}$, $I_B = 50\text{mA}$			1.2	V
Transition frequency	f_T	$V_{CE} = 10\text{V}$, $I_C = 20\text{mA}$, $f = 100\text{MHz}$	250			MHz
Delay time	t_d	$V_{CC} = 30\text{V}$, $V_{BE(off)} = -2\text{V}$ $I_C = 150\text{mA}$, $I_{B1} = 15\text{mA}$			15	ns
Rise time	t_r				20	ns
Storage time	t_s	$V_{CC} = 30\text{V}$, $I_C = 150\text{mA}$ $I_{B1} = I_{B2} = 15\text{mA}$			225	ns
Fall time	t_f				60	ns

The above data are for reference only.

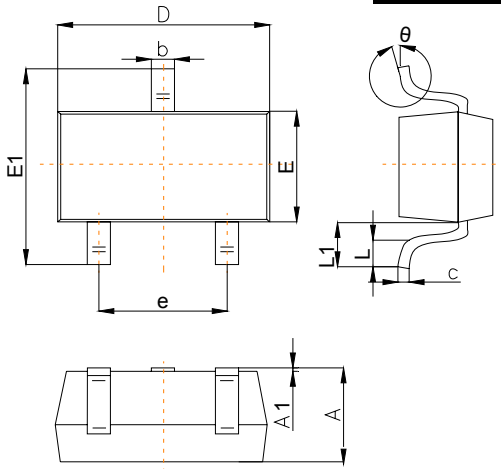
Typical Characteristics



The curve above is for reference only.

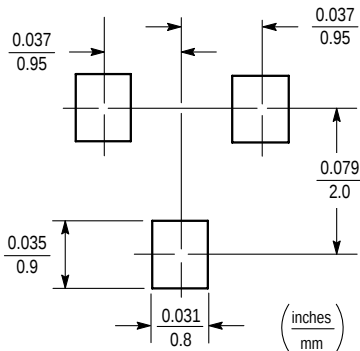
Outlitne Drawing

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.65		1.40
A1	0.00		0.20
b	0.30		0.55
c	0.08		0.20
D	2.70		3.10
E	1.15		1.65
E1	2.10		2.80
e	1.70		2.10
L	0.15		0.50
L1	0.35		0.70
θ	0°		12°

Suggested Pad Layout



Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
SOT-23	7'	330	3000	203×203×195	45000	438×438×220	180000