

400V High Voltage NPN Transistor

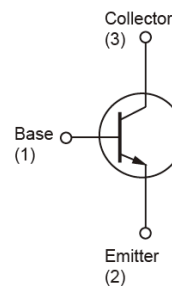
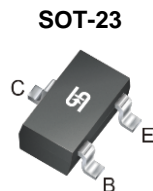
FEATURES

- Epitaxial Planar Type
- NPN Silicon Transistor
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

APPLICATION

- Consumer electronics
- High voltage switching
- High voltage driver

KEY PERFORMANCE PARAMETERS			
PARAMETER		VALUE	UNIT
BV _{CBO}		400	V
BV _{CEO}		400	V
I _C		300	mA
V _{CE(SAT)}	I _C =10mA, I _B =1mA	0.1	V



Notes: MSL 1 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Collector-Base Voltage	V _{CBO}	400	V
Collector-Emitter Voltage	V _{CEO}	400	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current (DC)	I _C	300	mA
Power Total Dissipation @ T _A =25°C	P _D	0.225	W
Maximum Operating Junction Temperature	T _J	+150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

Note: Single pulse, P_w ≤ 380μs, Duty ≤ 2%

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction to Ambient Thermal Resistance	R _{θJA}	556	°C/W
Junction to Case Thermal Resistance	R _{θJC}	185	°C/W

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note 1)						
Collector-Base Breakdown Voltage	$I_C = 50\mu\text{A}, I_E = 0$	BV_{CBO}	400	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 1\text{mA}, I_B = 0$	BV_{CEO}	400	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 50\mu\text{A}, I_C = 0$	BV_{EBO}	6	--	--	V
Collector Cutoff Current	$V_{CB} = 400\text{V}, I_E = 0$	I_{CBO}	--	--	10	μA
Collector-Emitter Reverse Current	$V_{CE} = 300\text{V}, R_{EB} = 4\text{k}\Omega$	I_{CER}	--	--	20	nA
Emitter Cutoff Current	$V_{EB} = 6\text{V}, I_C = 0$	I_{EBO}	--	--	10	μA
Collector-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1\text{mA}$	$V_{CE(SAT)}$	--	0.1	0.5	V
Base-Emitter Saturation Voltage	$I_C = 10\text{mA}, I_B = 1\text{mA}$	$V_{BE(SAT)}$	--	--	1.5	V
DC Current Transfer Ratio	$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	h_{FE}	100	--	270	
Dynamic (Note 2)						
Transition Frequency	$V_{CE} = 10\text{V}, I_C = -10\text{mA}, f = 10\text{MHz}$	f_T	--	20	--	MHz
Output Capacitance	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	C_{ob}	--	7	--	pF

Note:

1. Pulse test: $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$
2. For DESIGN AID ONLY, not subject to production testing

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TSC4505CX RFG	SOT-23	3,000pcs / 7" Reel

ELECTRICAL CHARACTERISTICS CURVES ($T_A=25^\circ\text{C}$, unless otherwise noted)

Figure 1. DC Current Gain

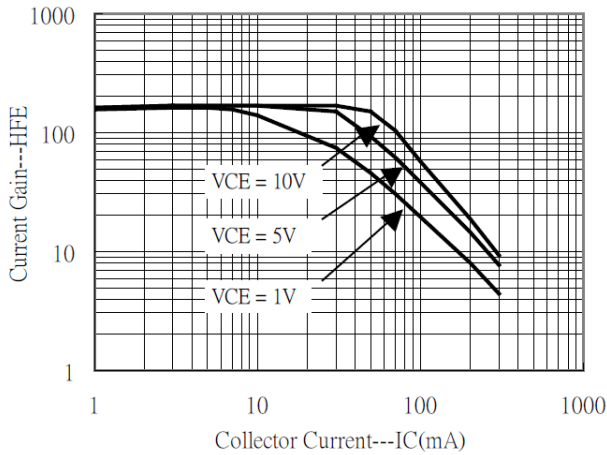


Figure 2. $V_{CE(SAT)}$ v.s. I_C

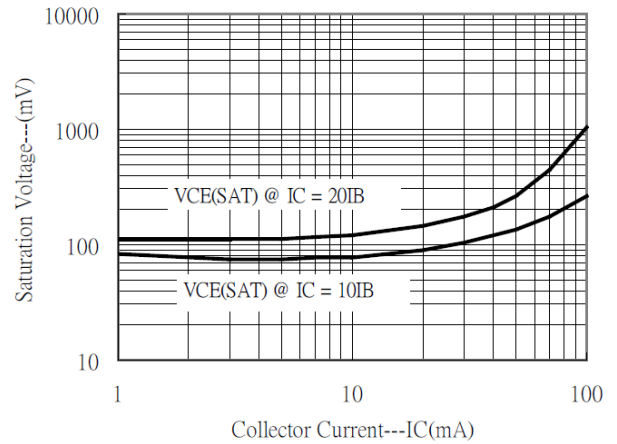


Figure 3. $V_{BE(SAT)}$ v.s. I_C

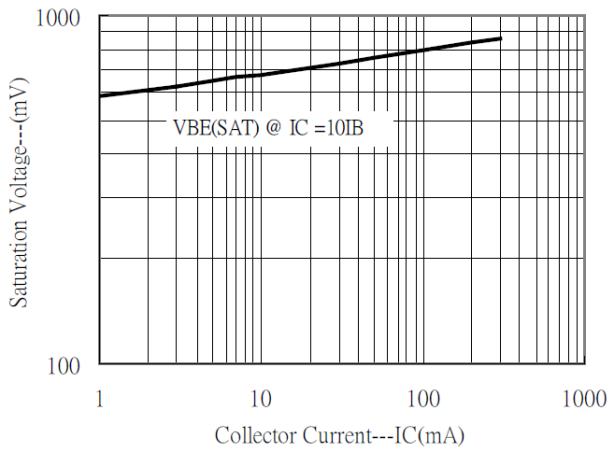


Figure 4. Power Derating Curve

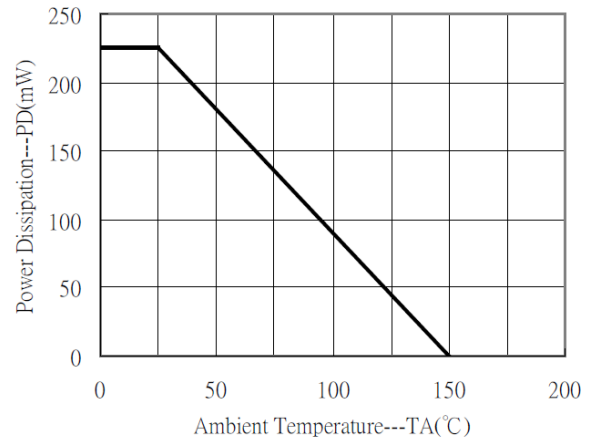
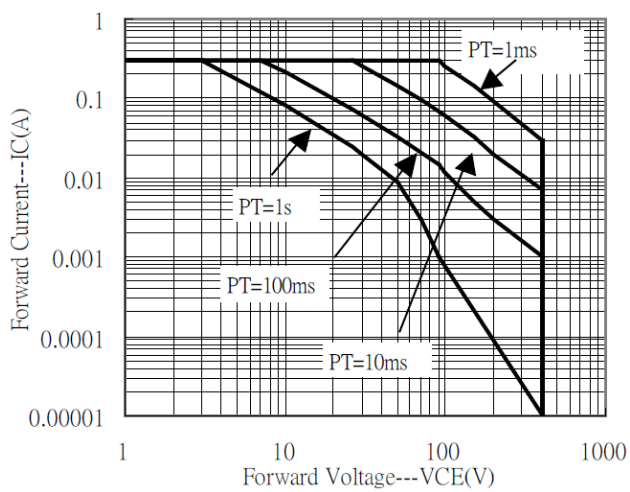
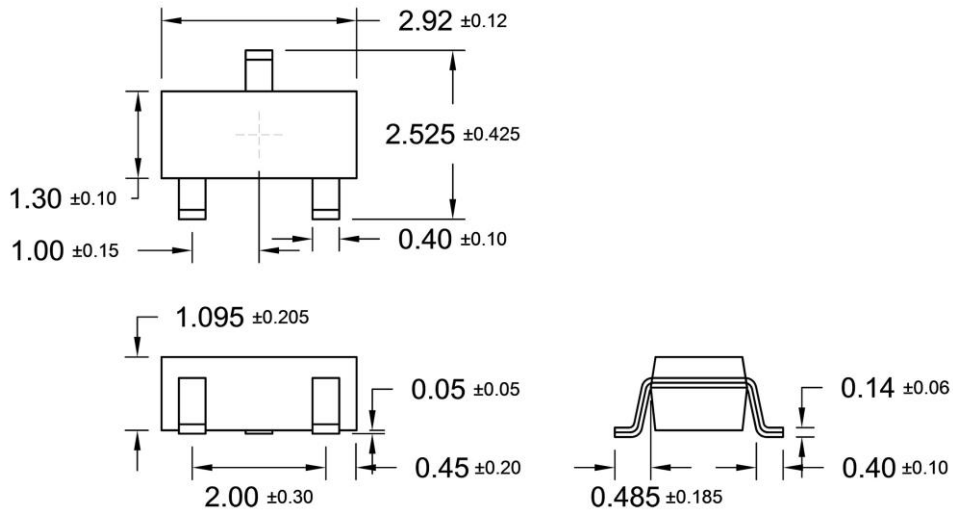


Figure 5. Safe Operating Area

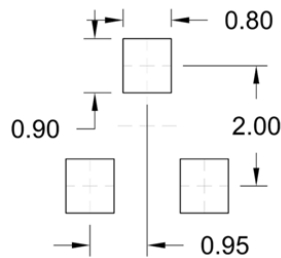


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

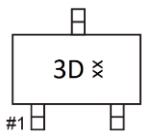
SOT-23



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



- 3D** = Device Code
- x** = Year Code
7=2017, 8=2018, 9=2019, 0=2020.....
- x** = Month Code
- 1** =Jan **2** =Feb **3** =Mar **4** =Apr
- 5** =May **6** =Jun **7** =Jul **8** =Aug
- 9** =Sep **A** =Oct **B** =Nov **C** =Dec