

300V High Performance NPN Transistor

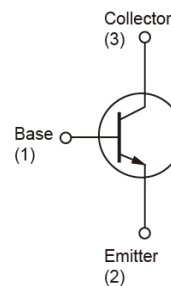
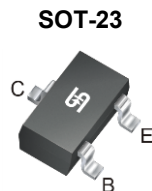
FEATURES

- 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}		300	V
BV _{CEO}		300	V
I _C		500	mA
V _{CE(SAT)}	I _C =100mA, I _B =10mA	0.2	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}	300	V
Collector-Emitter Voltage	V _{CEO}	300	V
Emitter-Base Voltage	V _{EBO}	5	V
Collector Current (DC)	I _C	500	mA
Collector Peak Current (Pulse) ^{Note}	I _{CM}	1	A
Base Current	I _B	200	mA
Power Total Dissipation @ T _A =25°C	P _D	0.5	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}	420	°C/W
Junction to Case Thermal Resistance	R _{θJC}	155	°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	$I_C = 100\mu\text{A}$	BV_{CBO}	300	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}$	BV_{CEO}	300	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 100\mu\text{A}$	BV_{EBO}	5	--	--	V
Collector Cutoff Current	$V_{CB} = 250\text{V}$	I_{CBO}	--	--	100	nA
Collector Cutoff Current	$V_{CES} = 250\text{V}$	I_{CES}	--	--	100	nA
Emitter Cutoff Current	$V_{EB} = 4\text{V}$	I_{EBO}	--	--	100	nA
Collector-Emitter Saturation Voltage	$I_C = 100\text{mA}, I_B = 10\text{mA}$	$V_{CE(SAT)}^1$	--	--	0.2	V
	$I_C = 250\text{mA}, I_B = 25\text{mA}$	$V_{CE(SAT)}^2$	--	--	0.3	V
Base-Emitter Saturation Voltage	$I_C = 250\text{mA}, I_B = 25\text{mA}$	$V_{BE(SAT)}$	--	--	1	V
Base-Emitter Turn-on Voltage	$I_C = 250\text{mA}, V_{CE} = 10\text{V}$	$V_{BE(ON)}$	--	--	1	V
DC Current Transfer Ratio	$V_{CE} = 10\text{V}, I_C = 1\text{mA}$,	h_{FE}^1	100	--	--	
	$V_{CE} = 10\text{V}, I_C = 100\text{mA}$,	h_{FE}^2	80	--	300	
	$V_{CE} = 10\text{V}, I_C = 250\text{mA}$,	h_{FE}^3	20	--	--	
Dynamic (Note 2)						
Transition Frequency	$V_{CE} = -10\text{V}, I_C = -30\text{mA}$, $f = 100\text{MHz}$	f_T	75	--	--	MHz
Collector Output Capacitance	$V_{CB} = -10\text{V}, I_E = 0\text{A}$, $f = 100\text{MHz}$	C_{ob}	--	--	5	pF
Delay Time	$V_{CC} = 100\text{V}, I_C = 100\text{mA}$, $I_{B1} = -I_{B2} = 10\text{mA}$	t_d	--	53	--	ns
Rise Time		t_r	--	126	--	ns
Storage Time		t_s	--	2580	--	ns
Fall Time		t_f	--	228	--	ns

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
TSC497CX RFG	SOT-23	3,000pcs / 7" Reel

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

Figure 1. $V_{CE(sat)}$ vs. Collector Current

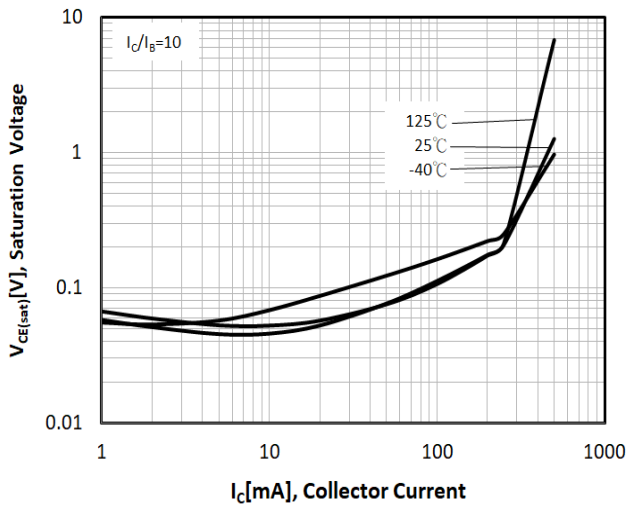


Figure 2. DC Current Gain

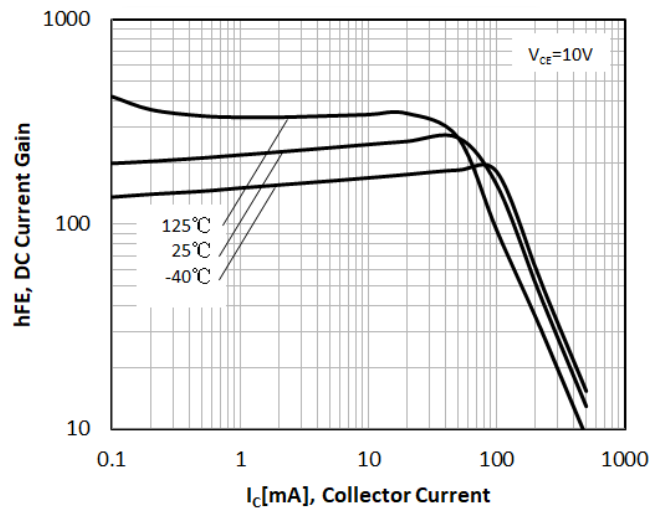


Figure 3. $V_{BE(sat)}$ vs. Collector Current

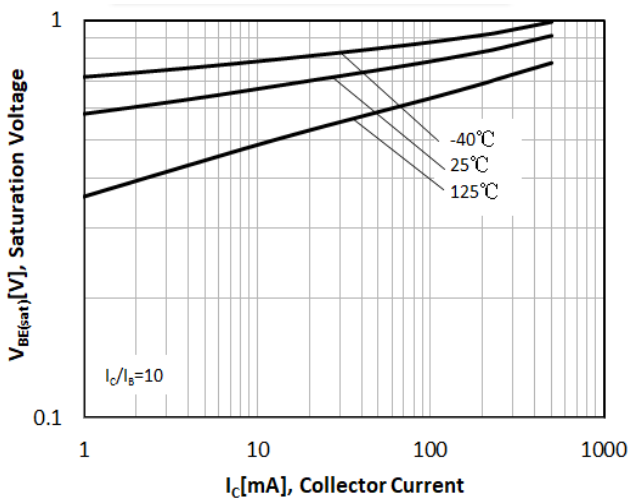


Figure 4. $V_{BE(on)}$ vs. Collector Current

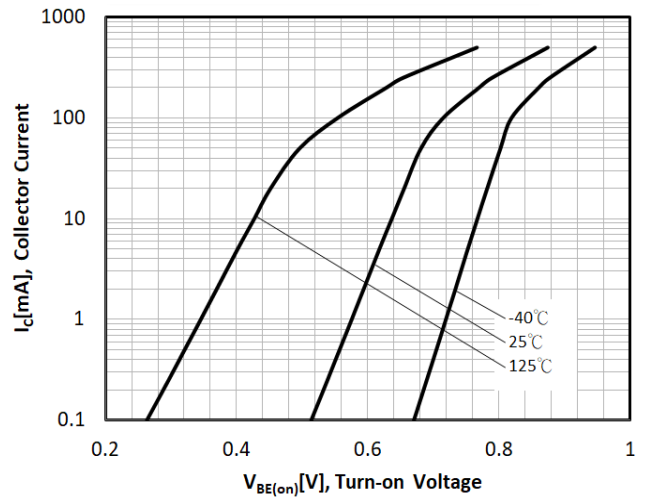
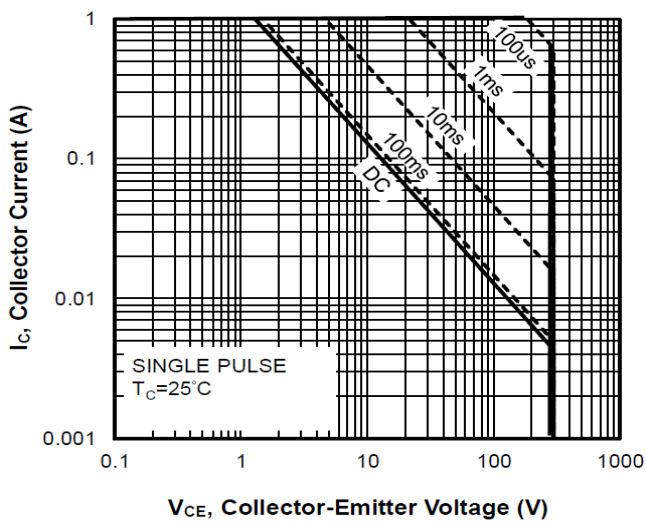
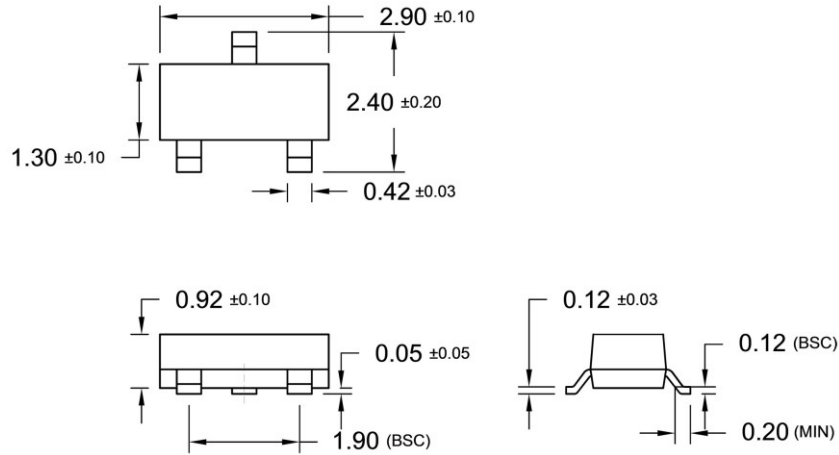


Figure 5. Safe Operating Area

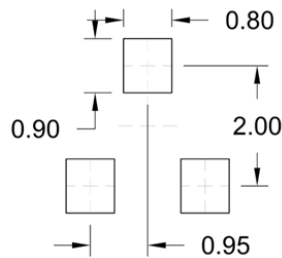


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

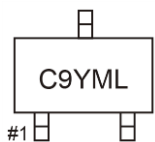
SOT-23



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



- C9** = Device Code
- Y** = Year Code
- M** = Month Code for Halogen Free Product
 - O** =Jan **P** =Feb **Q** =Mar **R** =Apr
 - S** =May **T** =Jun **U** =Jul **V** =Aug
 - W** =Sep **X** =Oct **Y** =Nov **Z** =Dec
- L** = Lot Code (1~9, A~Z)

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