

NPN Silicon Planar High Voltage Transistor

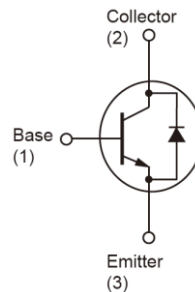
FEATURES

- High BV_{CEO} , BV_{CBO}
- High current gain
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-Free according to IEC 61249-2-21

APPLICATION

- Lighting
- Switch mode power supply

KEY PERFORMANCE PARAMETERS			
PARAMETER		VALUE	UNIT
BV_{CEO}		400	V
BV_{CBO}		600	V
I_C		300	mA
$V_{CE(SAT)}$	$I_C=50mA, I_B=5mA$	0.5	V



Notes: MSL 3 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Collector-Base Voltage		V_{CBO}	600	V
Collector-Emitter Voltage		V_{CES}	600	V
Collector-Emitter Voltage @ $V_{BE}=0V$		V_{CES}	400	V
Emitter-Base Voltage		V_{EBO}	7	V
Collector Current	DC	I_C	0.3	A
	Pulse		1	A
Power Total Dissipation @ $T_A=25^\circ\text{C}$		P_{DTOT}	1	W
Maximum Operating Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	-55 to +150	$^\circ\text{C}$

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	91	$^\circ\text{C/W}$
Junction to Case Thermal Resistance	$R_{\theta JC}$	25	$^\circ\text{C/W}$

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note 1)						
Collector-Base voltage	$I_C = 50\mu\text{A}$	BV_{CBO}	600	--	--	V
Collector-Emitter Saturation Voltage	$I_C = 100\mu\text{A}, V_{BE} = 0$	BV_{CES}	600	--	--	V
Collector-Emitter breakdown voltage	$I_C = 1\text{mA}$	BV_{CEO}	400	--	--	V
Emitter-Base breakdown voltage	$I_E = 50\mu\text{A}$	BV_{EBO}	7	--	--	V
Emitter cut-off current	$V_{EB} = 7\text{V}$	I_{EBO}	--	--	1.5	μA
Collector cut-off current	$V_{CB} = 600\text{V}$	I_{CBO}	--	--	0.5	μA
Collector-Emitter Cutoff Current	$V_{CE} = 400\text{V}$	I_{CEO}	--	--	1	μA
Collector-Emitter saturation voltage	$I_C = 50\text{mA}, I_B = 5\text{mA}$	$V_{CE(SAT)}$	---	--	0.5	V
Base-Emitter saturation voltage	$I_C = 50\text{mA}, I_B = 5\text{mA}$	$V_{BE(SAT)}$	--	--	1	V
DC Current Gain	$V_{CE} = 5\text{V}, I_C = 1\text{mA}$	h_{FE1}	100	--	--	
	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$	h_{FE2}	90	--	300	
Transition Frequency	$V_{CE} = 10\text{V}, I_E = 20\text{mA}$	f_T	50	--	--	MHz
Output Capacitance	$V_{CB} = 20\text{V}, f = 1\text{MHz}$	C_{ob}	--	--	7	pF

Notes:

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

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSC966CW RPG	SOT-223	2,500pcs / 13"Reel

Electrical Characteristics Curve

($T_a = 25^\circ\text{C}$, unless otherwise noted)

Figure 1. Static Characteristics

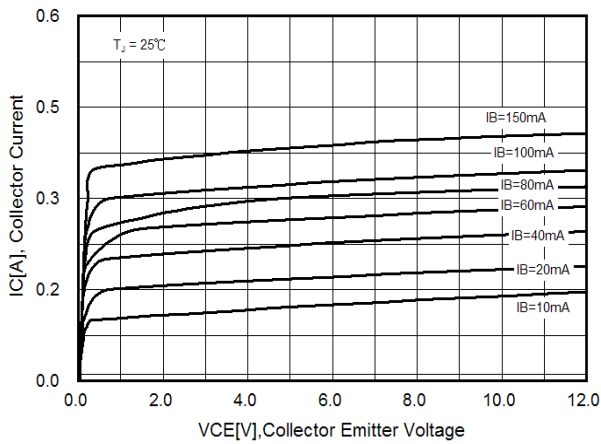


Figure 2. DC Current Gain

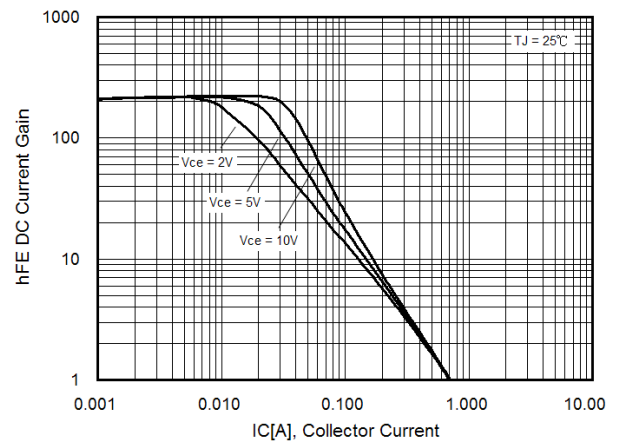


Figure 3. DC Current Gain

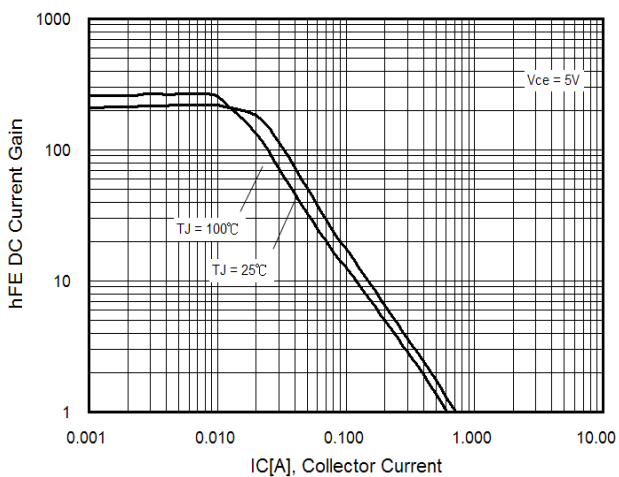


Figure 4. $V_{CE(sat)}$ vs I_c

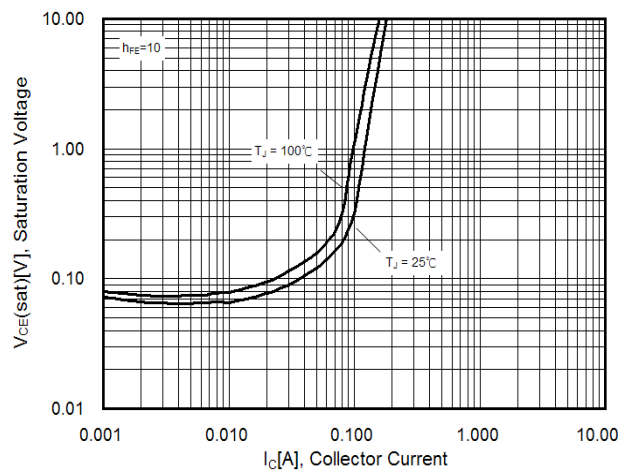


Figure 5. $V_{BE(sat)}$ vs I_c

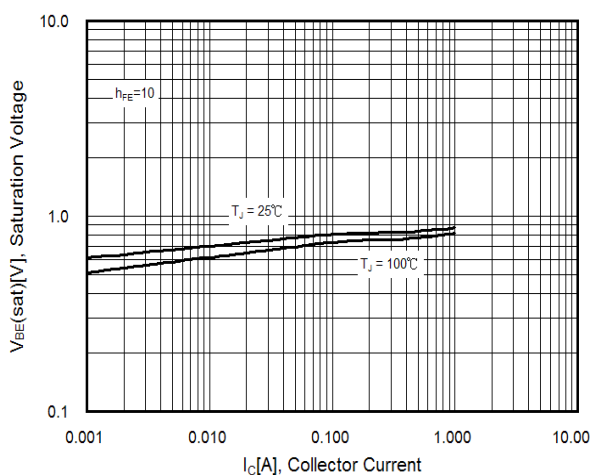
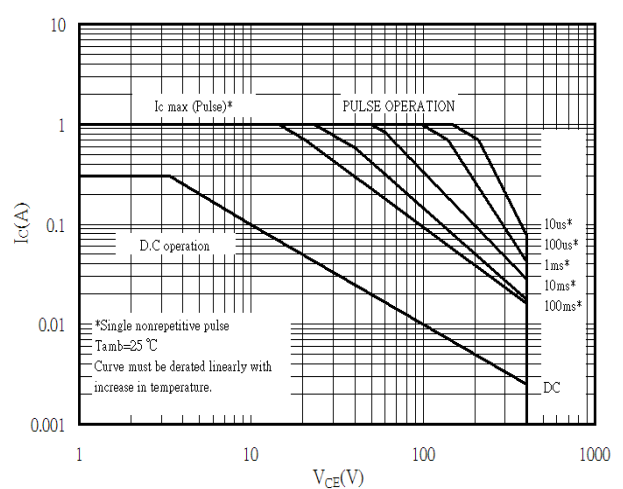
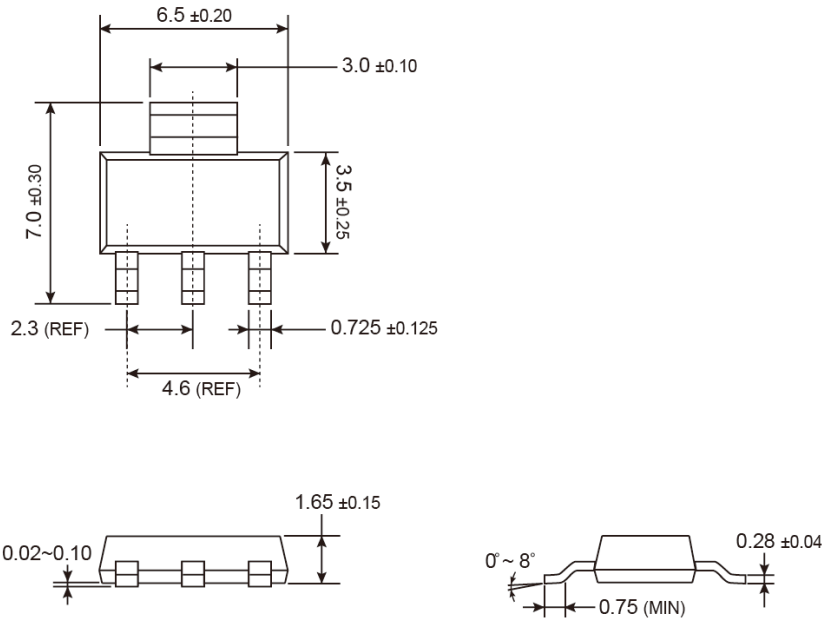


Figure 6. Safety Operation Area

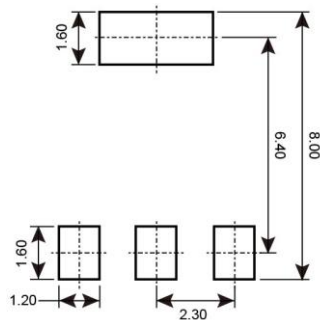


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

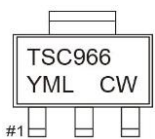
SOT-223



SUGGESTED PAD LAYOUT (Unit: Millimeters)



Marking Diagram



- 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

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