

## NPN Silicon Planar High Voltage Transistor

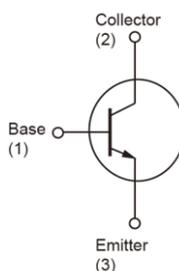
### FEATURES

- High  $BV_{CEO}$ ,  $BV_{CBO}$
- High current gain
- RoHS Compliant
- 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
$I_C$		1	A
$V_{CE(SAT)}$	$I_C=0.5A, I_B=0.1A$	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		$V_{CEO}$	400	V
Emitter-Base Voltage		$V_{EBO}$	9	V
Collector Current	DC	$I_C$	1	A
	Pulse		2	A
Power Total Dissipation @ $T_A=25^\circ\text{C}$		$P_{DTOT}$	1.2	W
Maximum Operating Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature Range		$T_{STG}$	-55 to +150	$^\circ\text{C}$

**Note:** Single pulse,  $P_w \leq 380\mu\text{s}$ , Duty  $\leq 2\%$

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	TYP	UNIT
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Junction to Case Thermal Resistance	$R_{\theta JC}$	17.2	$^\circ\text{C/W}$

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
<b>Static</b> (Note 1)						
Collector-Base voltage	$I_C = 100\mu\text{A}$	$BV_{CBO}$	600	--	--	V
Collector-Emitter breakdown voltage	$I_C = 1\text{mA}$	$BV_{CEO}$	400	--	--	V
Emitter-Base breakdown voltage	$I_E = 100\mu\text{A}$	$BV_{EBO}$	9	--	--	V
Emitter cut-off current	$V_{EB} = 8\text{V}$	$I_{EBO}$	--	--	100	$\mu\text{A}$
Collector cut-off current	$V_{CB} = 600\text{V}$	$I_{CBO}$	--	--	100	$\mu\text{A}$
Collector-Emitter Cutoff Current	$V_{CE} = 400\text{V}$	$I_{CEO}$	--	--	1	mA
Collector-Emitter saturation voltage	$I_C = 500\text{mA}, I_B = 100\text{mA}$	$V_{CE(SAT) 1}$	---	--	0.5	V
Collector-Emitter saturation voltage	$I_C = 1\text{A}, I_B = 250\text{mA}$	$V_{CE(SAT) 2}$	---	--	1	V
Base-Emitter saturation voltage	$I_C = 500\text{mA}, I_B = 100\text{mA}$	$V_{BE(SAT) 1}$	--	--	1	V
Base-Emitter saturation voltage	$I_C = 1\text{A}, I_B = 250\text{mA}$	$V_{BE(SAT) 2}$	--	--	1.2	V
DC Current Gain	$V_{CE} = 10\text{V}, I_C = 250\text{mA}$	$h_{FE1}$	80	--	--	
<b>Resistive Load Switching Time</b> (Note 2)						
Turn-on Time	$V_{CC} = 125\text{V}, I_C = 1\text{A},$ $I_{B1} = I_{B2} = 200\text{mA}$	$t_{on}$	--	1	--	$\mu\text{s}$
Storage Time		$t_{stg}$	--	4	--	$\mu\text{s}$
Fall Time		$t_f$	--	0.7	--	$\mu\text{s}$

**Notes:**

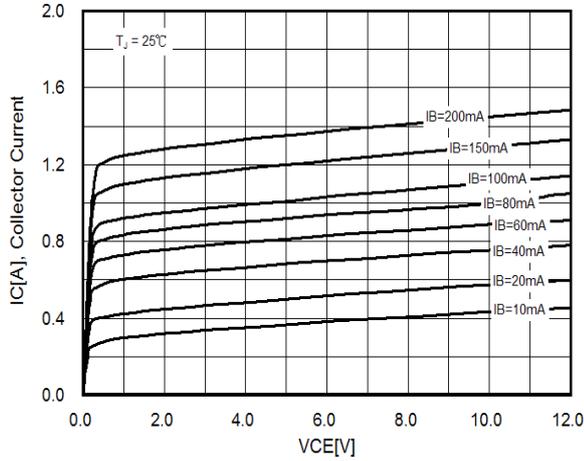
1. Pulse test:  $\leq 380\mu\text{s}$ , duty cycle  $\leq 2\%$
2. For DESIGN AID ONLY, not subject to production testing.

**ORDERING INFORMATION**

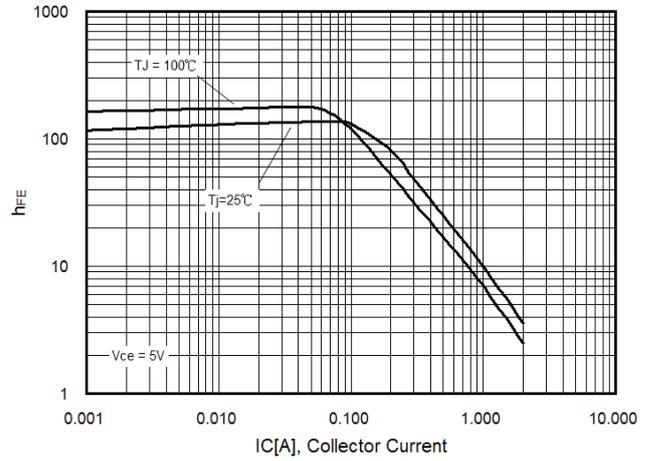
ORDERING CODE	PACKAGE	PACKING
TSC873CW RPG	SOT-223	2,500pcs / 13" Reel

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

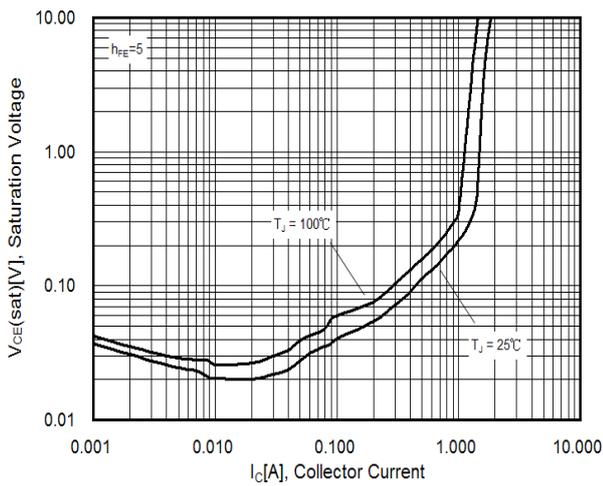
**Figure 1. Static Characteristics**



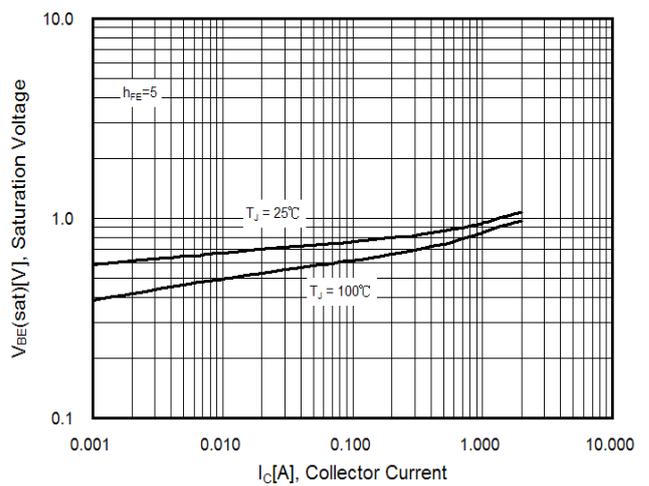
**Figure 2. DC Current Gain**



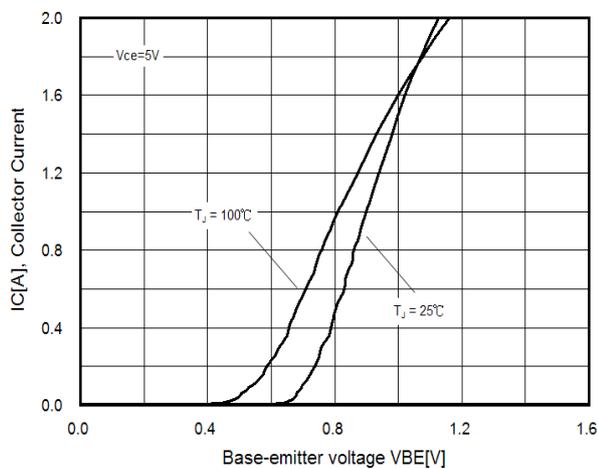
**Figure 3.  $V_{CE(sat)}$  vs.  $I_C$**



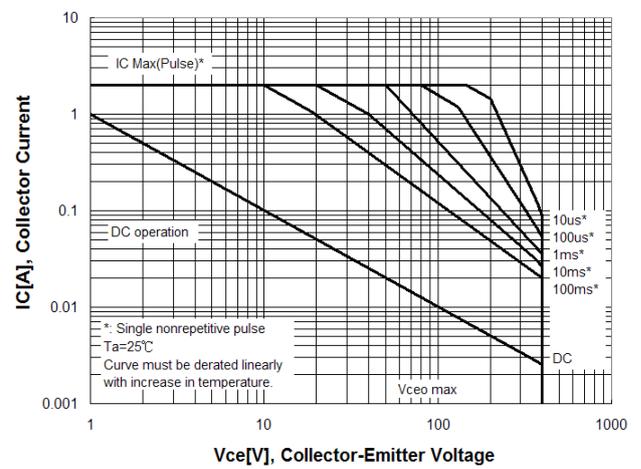
**Figure 4.  $V_{BE(sat)}$  vs.  $I_C$**



**Figure 5.  $V_{BE(on)}$  vs.  $I_C$**

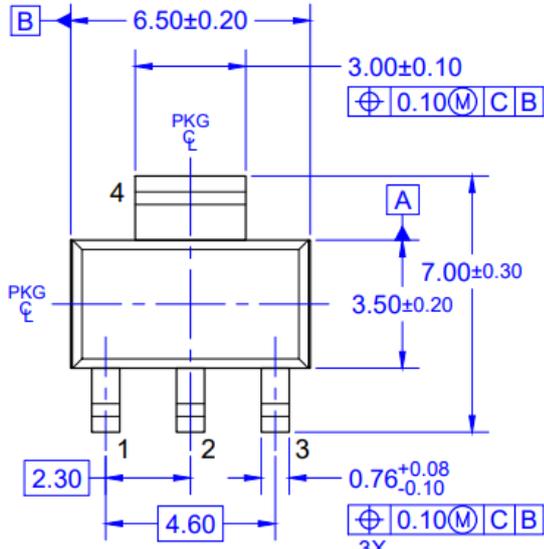


**Figure 6. Safety Operation Area**

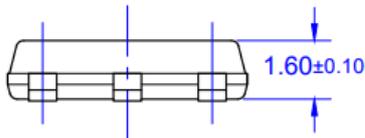


**PACKAGE OUTLINE DIMENSIONS** (Unit: Millimeters)

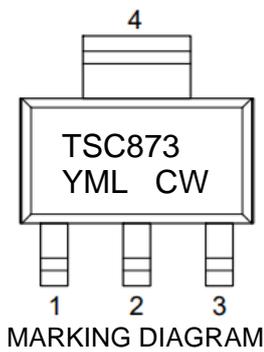
**SOT-223**



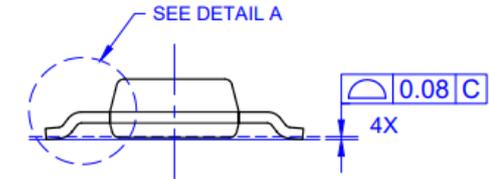
TOP VIEW



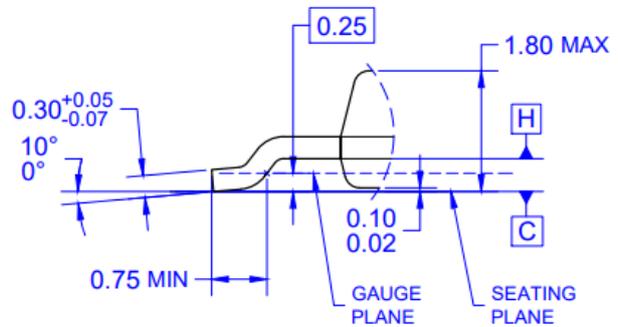
FRONT VIEW



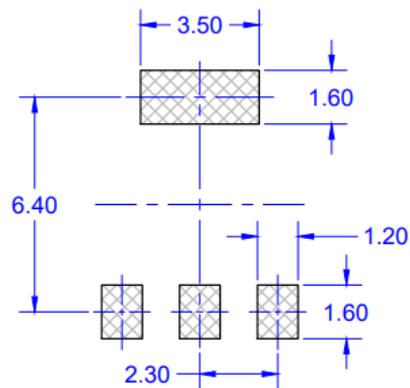
MARKING DIAGRAM



SIDE VIEW (ROTATED -90°)



DETAIL A  
(SCALE 2:1)



SUGGESTED PAD LAYOUT

- 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

- NOTES: UNLESS OTHERWISE SPECIFIED  
1. ALL DIMENSIONS ARE IN MILLIMETERS.  
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.  
3. PACKAGE OUTLINE REFERENCE: TO-261, VARIATION AA, ISSUE C, DATED MAY 2002.  
4. DATUMS A AND B ARE TO BE DETERMINED AT DATUM H.  
5. DWG NO REF: HQ2SD07-001 REV A

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