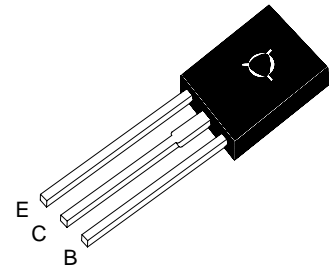


# ST 13002T / ST 13003T

## NPN Silicon Power Transistors

These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical.

They are particularly suited for 115 and 220V SWITCHMODE applications such as Switching Regulator's, Inverters, Motor Controls, Solenoid / Relay drivers and Deflection circuits.

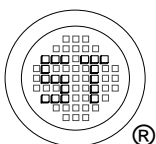


TO-126 Plastic Package

### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

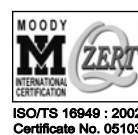
Parameter	Symbol	Value		Unit
		ST13002T	ST13003T	
Collector Emitter Voltage	$V_{CEO(sus)}$	300	400	V
Collector Emitter Voltage	$V_{CEV}$	600	700	V
Emitter Base Voltage	$V_{EBO}$	9		V
Collector Current - Continuous	$I_C$	1.5		A
- Peak <sup>1)</sup>	$I_{CM}$	3		
Base Current - Continuous	$I_B$	0.75		A
- Peak <sup>1)</sup>	$I_{BM}$	1.5		
Emitter Current - Continuous	$I_E$	2.25		A
- Peak <sup>1)</sup>	$I_{EM}$	4.5		
Total Power Dissipation @ $T_A = 25\text{ }^\circ\text{C}$	$P_D$	1.4		W
Derate above $25\text{ }^\circ\text{C}$		11.2		mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25\text{ }^\circ\text{C}$	$P_D$	40		W
Derate above $25\text{ }^\circ\text{C}$		320		mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_S$	-65 to +150		$^\circ\text{C}$
Thermal Resistance ,Junction to Ambient	$R_{\theta JA}$	89		$^\circ\text{C/W}$
Thermal Resistance ,Junction to Case	$R_{\theta JC}$	3.12		$^\circ\text{C/W}$

<sup>1)</sup> Pulse Test: Pulse Width=5ms, Duty Cycle≤10%.



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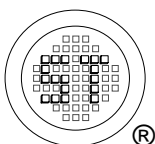


# ST 13002T / ST 13003T

## Characteristics at $T_a = 25\text{ }^\circ\text{C}$

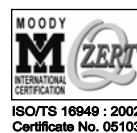
Parameter	Symbol	Min.	Typ.	Max.	Unit		
DC Current Gain							
at $V_{CE} = 2\text{ V}$ , $I_C = 0.5\text{ A}$	$h_{FE}$	8	-	40	-		
at $V_{CE} = 2\text{ V}$ , $I_C = 1\text{ A}$	$h_{FE}$	5	-	25	-		
Collector Emitter Sustaining Voltage							
at $I_C = 10\text{ mA}$	ST13002T $V_{CEO(sus)}$	300	-	-	V		
	ST13003T $V_{CEO(sus)}$	400	-	-	V		
Collector Cutoff Current							
at $V_{CEV} = \text{Rated Value}$ , $V_{BE(off)} = 1.5\text{ V}$	$I_{CEV}$	-	-	1	mA		
Emitter Cutoff Current							
at $V_{EB} = 9\text{ V}$	$I_{EBO}$	-	-	1	mA		
Collector Emitter Saturation Voltage							
at $I_C = 0.5\text{ A}$ , $I_B = 0.1\text{ A}$	$V_{CE(sat)}$	-	-	0.5	V		
at $I_C = 1\text{ A}$ , $I_B = 0.25\text{ A}$	$V_{CE(sat)}$	-	-	1	V		
at $I_C = 1.5\text{ A}$ , $I_B = 0.5\text{ A}$	$V_{CE(sat)}$	-	-	3	V		
Base Emitter Saturation Voltage							
at $I_C = 0.5\text{ A}$ , $I_B = 0.1\text{ A}$	$V_{BE(sat)}$	-	-	1	V		
at $I_C = 1\text{ A}$ , $I_B = 0.25\text{ A}$	$V_{BE(sat)}$	-	-	1.2	V		
Current Gain Bandwidth Product							
at $V_{CE} = 10\text{ V}$ , $I_C = 100\text{ mA}$ , $f = 1\text{ MHz}$	$f_T$	4	10	-	MHz		
Output Capacitance							
at $V_{CB} = 10\text{ V}$ , $f = 0.1\text{ MHz}$	$C_{ob}$	-	21	-	pF		
Delay Time	( $V_{CC} = 125\text{ V}$ , $I_C = 1\text{ A}$ , $I_{B1} = I_{B2} = 0.2\text{ A}$ , $t_p = 25\text{ }\mu\text{s}$ , Duty Cycle $\leq 1\%$ )	$t_d$	-	-	0.1	$\mu\text{s}$	
Rise Time		$t_r$	-	-	1	$\mu\text{s}$	
Storage Time		$t_s$	-	-	4	$\mu\text{s}$	
Fall Time		$t_f$	-	-	0.7	$\mu\text{s}$	
Storage Time		( $I_C = 1\text{ A}$ , $V_{clamp} = 300\text{ V}$ , $I_{B1} = 0.2\text{ A}$ , $V_{BE(off)} = 5\text{ V}$ , $T_C = 100\text{ }^\circ\text{C}$ )	$t_{sv}$	-	-	4	$\mu\text{s}$
Crossover Time		$t_c$	-	-	0.75	$\mu\text{s}$	
Fall Time		$t_{fi}$	-	0.15	-	$\mu\text{s}$	

1) Pulse Test: Pulse Width=300 $\mu\text{s}$ , Duty Cycle $\leq 2\%$ .



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ISO/TS 16949 : 2002 Certificate No. 05103  
ISO 14001:2004 Certificate No. 7116  
ISO 9001:2000 Certificate No. 050698

Dated : 28/04/2006