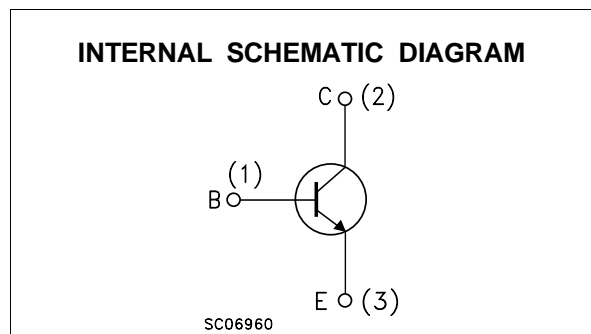
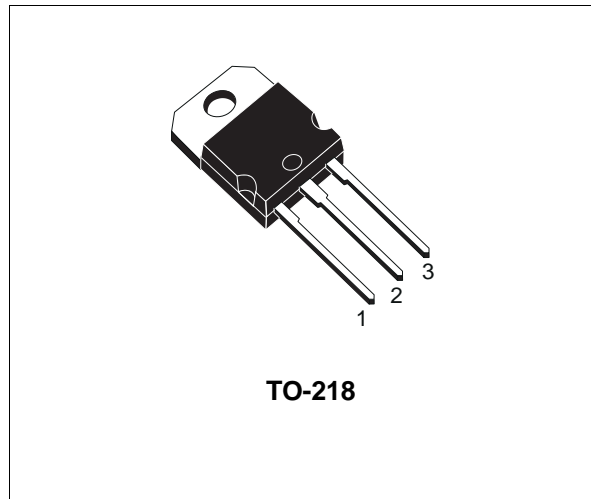


## SILICON NPN SWITCHING TRANSISTOR

- SGS-THOMSON PREFERRED SALESTYPE
- VERY LOW SATURATION VOLTAGE AND HIGH GAIN FOR REDUCED LOAD OPERATION
- TURN-ON AND TURN-OFF TAIL SPECIFICATIONS
- TURN-ON  $di/dt$  FOR BETTER RECTIFIER CHOICE
- SWITCHING TIMES SPECIFIED WITH AND WITHOUT NEGATIVE BASE DRIVE
- FAST SWITCHING TIMES
- LOW SWITCHING LOSSES
- LOW ON-STATE VOLTAGE DROP
- BASE CURRENT REQUIREMENTS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CEV}$	Collector-emitter Voltage ( $V_{BE} = -1.5V$ )	250	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )	125	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_C$	Collector Current	25	A
$I_{CM}$	Collector Peak Current	50	A
$I_B$	Base Current	6	A
$I_{BM}$	Base Peak Current	12	A
$P_{Base}$	Reverse Bias Base Power Dissipation (B.E. junction in avalanche)	2	W
$P_{tot}$	Total Power Dissipation at $T_{case} \leq 25\text{ }^\circ\text{C}$	150	W
$T_{stg}$	Storage Temperature	-65 to 175	$^\circ\text{C}$
$T_j$	Max Operating Junction Temperature	175	$^\circ\text{C}$

**THERMAL DATA**

R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	1	°C/W
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**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CER</sub>	Collector Cut-off Current (R <sub>BE</sub> = 10Ω)	V <sub>CE</sub> = V <sub>CEV</sub> V <sub>CE</sub> = V <sub>CEV</sub> T <sub>C</sub> = 100°C			1 5	mA mA
I <sub>CEV</sub>	Collector Cut-off Current	V <sub>CE</sub> = V <sub>CEV</sub> V <sub>BE</sub> = -1.5V V <sub>CE</sub> = V <sub>CEV</sub> V <sub>BE</sub> = -1.5V T <sub>C</sub> =100°C			1 5	mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 5 V			1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 0.2A L = 25 mH	125			V
V <sub>EBO</sub>	Emitter-base Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = 50 mA	7			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 10A I <sub>B</sub> = 0.5A I <sub>C</sub> = 20A I <sub>B</sub> = 2A I <sub>C</sub> = 10A I <sub>B</sub> = 0.5A T <sub>j</sub> = 100°C I <sub>C</sub> = 20A I <sub>B</sub> = 2A T <sub>j</sub> = 100°C		0.4 0.6 0.5 0.75	0.8 0.9 0.9 1.5	V V V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 20A I <sub>B</sub> = 2A I <sub>C</sub> = 20A I <sub>B</sub> = 2A T <sub>j</sub> = 100°C		1.25 1.25	1.6 1.7	V V
di <sub>C</sub> /dt*	Rate of Rise of on-state Collector Current	V <sub>CC</sub> = 160V R <sub>C</sub> = 0 I <sub>B1</sub> = 3A T <sub>j</sub> = 25°C T <sub>j</sub> = 100°C	50 45	100 85		A/μs A/μs
V <sub>CE(2μs)</sub>	Collector-Emitter Dynamic Voltage	V <sub>CC</sub> = 100V R <sub>C</sub> = 5Ω I <sub>B1</sub> = 2A T <sub>j</sub> = 25°C T <sub>j</sub> = 100°C		1.4 2.1	3 4	V V
V <sub>CE(4μs)</sub>	Collector-Emitter Dynamic Voltage	V <sub>CC</sub> = 100V R <sub>C</sub> = 5Ω I <sub>B1</sub> = 2A T <sub>j</sub> = 25°C T <sub>j</sub> = 100°C		1.1 1.5	2 2.5	V V

\* Pulsed: Pulse duration = 300 μs, duty cycle = 2 %

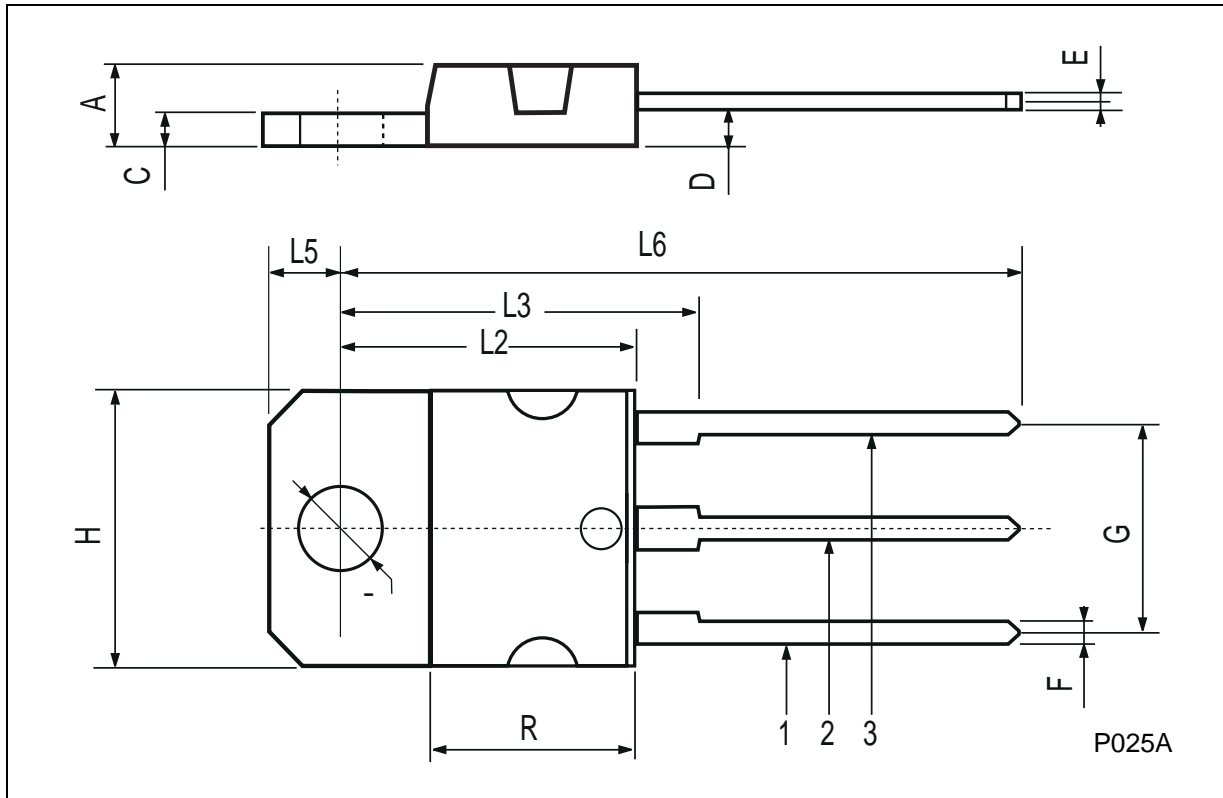
## ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	<b>RESISTIVE LOAD</b>					
$t_r$	Rise Time	$V_{CC} = 100V$ $I_C = 24A$		0.33	0.6	$\mu s$
$t_s$	Storage Time	$V_{BB} = -5V$ $I_{B1} = 3A$		0.75	1.2	$\mu s$
$t_f$	Fall Time	$R_B = 0.83\Omega$ $T_p = 30\mu s$		0.15	0.3	$\mu s$
	<b>INDUCTIVE LOAD</b>					
$t_s$	Storage Time	$V_{CC} = 100V$ $V_{clamp} = 125V$		0.85	1.4	$\mu s$
$t_f$	Fall Time	$I_C = 20A$ $I_B = 2A$		0.09	0.2	$\mu s$
$t_t$	Tail Time in Turn-on	$V_{BB} = -5V$ $R_B = 1.3\Omega$		0.04	0.05	$\mu s$
$t_c$	Crossover Time	$L_C = 0.25mH$		0.16	0.3	$\mu s$
$t_s$	Storage Time	$V_{CC} = 100V$ $V_{clamp} = 125V$		1.2	1.7	$\mu s$
$t_f$	Fall Time	$I_C = 20A$ $I_B = 2A$		0.17	0.3	$\mu s$
$t_t$	Tail Time in Turn-on	$V_{BB} = -5V$ $R_B = 1.3\Omega$		0.07	0.1	$\mu s$
$t_c$	Crossover Time	$L_C = 0.25mH$ $T_j = 100^\circ C$		0.3	0.5	$\mu s$
$t_s$	Storage Time	$V_{CC} = 100V$ $V_{clamp} = 125V$		2.1		$\mu s$
$t_f$	Fall Time	$I_C = 20A$ $I_B = 2A$		0.7		$\mu s$
$t_t$	Tail Time in Turn-on	$V_{BB} = 0$ $R_B = 4.7\Omega$		0.28		$\mu s$
		$L_C = 0.25mH$				
$t_s$	Storage Time	$V_{CC} = 100V$ $V_{clamp} = 125V$		3.2		$\mu s$
$t_f$	Fall Time	$I_C = 20A$ $I_B = 2A$		1.2		$\mu s$
$t_t$	Tail Time in Turn-on	$V_{BB} = 0$ $R_B = 4.7\Omega$		0.55		$\mu s$
		$L_C = 0.25mH$ $T_j = 100^\circ C$				

\* Pulsed: Pulse duration = 300  $\mu s$ , duty cycle = 2 %

**TO-218 (SOT-93) MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.7		4.9	0.185		0.193
C	1.17		1.37	0.046		0.054
D		2.5			0.098	
E	0.5		0.78	0.019		0.030
F	1.1		1.3	0.043		0.051
G	10.8		11.1	0.425		0.437
H	14.7		15.2	0.578		0.598
L2	-		16.2	-		0.637
L3		18			0.708	
L5	3.95		4.15	0.155		0.163
L6		31			1.220	
R	-		12.2	-		0.480
∅	4		4.1	0.157		0.161



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