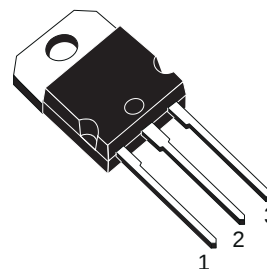


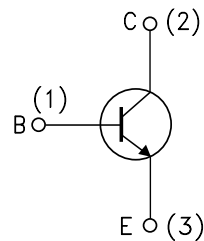
SILICON NPN SWITCHING TRANSISTOR

- 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_c/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



TO-218

INTERNAL SCHEMATIC DIAGRAM



SC06960

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 $T_{case} \leq 25^\circ C$	150	W
T_{stg}	Storage Temperature	-65 to 175	$^\circ C$
T_j	Max Operating Junction Temperature	175	$^\circ C$

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	1	$^{\circ}C/W$
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cut-off Current ($R_{BE} = 10\Omega$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV} \quad T_C = 100^{\circ}C$			1 5	mA mA
I_{CEV}	Collector Cut-off Current	$V_{CE} = V_{CEV} \quad V_{BE} = -1.5V$ $V_{CE} = V_{CEV} \quad V_{BE} = -1.5V \quad T_C = 100^{\circ}C$			1 5	mA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5V$			1	mA
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage	$I_C = 0.2A$ $L = 25mH$	125			V
V_{EB0}	Emitter-base Voltage ($I_C = 0$)	$I_E = 50mA$	7			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 10A \quad I_B = 0.5A$ $I_C = 20A \quad I_B = 2A$ $I_C = 10A \quad I_B = 0.5A \quad T_j = 100^{\circ}C$ $I_C = 20A \quad I_B = 2A \quad T_j = 100^{\circ}C$		0.4 0.6 0.5 0.75	0.8 0.9 0.9 1.5	V V V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 20A \quad I_B = 2A$ $I_C = 20A \quad I_B = 2A \quad T_j = 100^{\circ}C$		1.25 1.25	1.6 1.7	V V
di_C/dt^*	Rate of Rise of on-state Collector Current	$V_{CC} = 160V \quad R_C = 0$ $I_{B1} = 3A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$	50 45	100 85		A/ μs A/ μs
$V_{CE(2\mu s)}$	Collector-Emitter Dynamic Voltage	$V_{CC} = 100V \quad R_C = 5\Omega$ $I_{B1} = 2A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$		1.4 2.1	3 4	V V
$V_{CE(4\mu s)}$	Collector-Emitter Dynamic Voltage	$V_{CC} = 100V \quad R_C = 5\Omega$ $I_{B1} = 2A$ $T_j = 25^{\circ}C$ $T_j = 100^{\circ}C$		1.1 1.5	2 2.5	V V

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

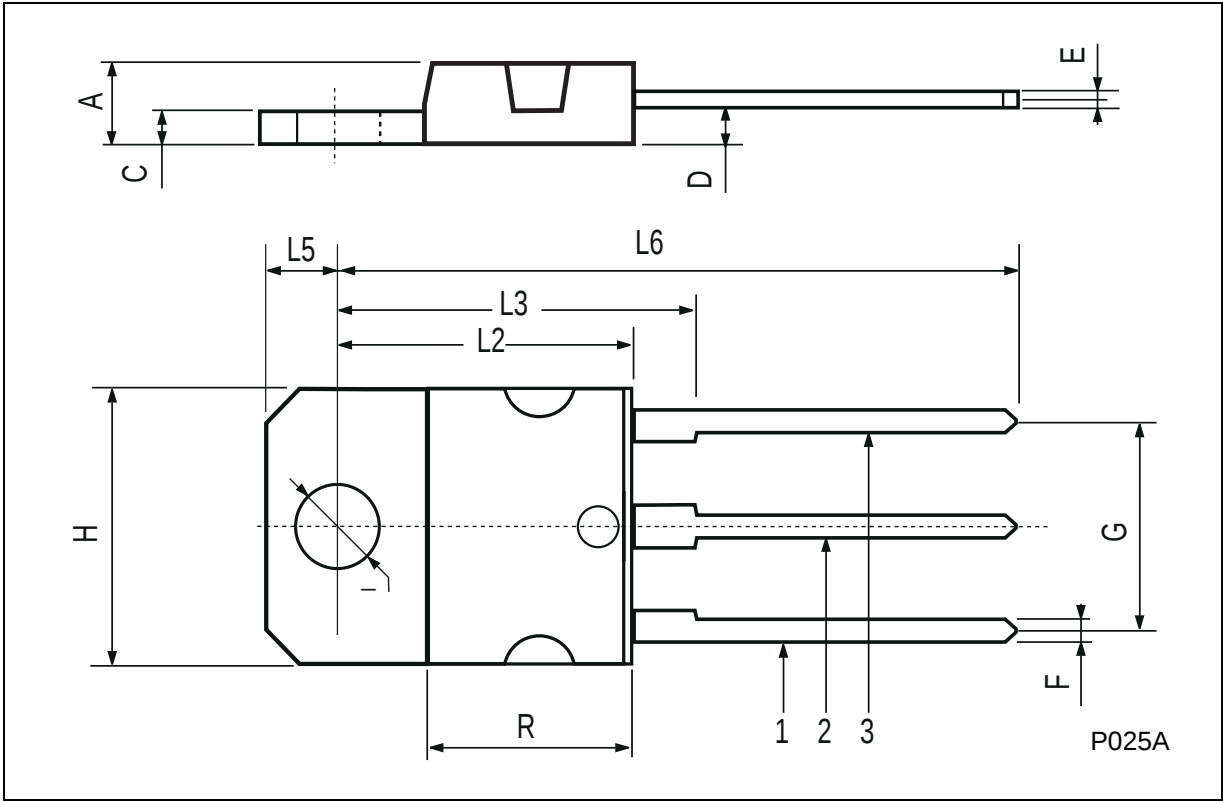
ELECTRICAL CHARACTERISTICS (continued)

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

* Pulsed: Pulse duration = 300 μs , 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
Ø	4		4.1	0.157		0.161



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