

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

- SGS-THOMSON PREFERRED SALESTYPES
- HIGH VOLTAGE CAPABILITY
- VERY HIGH SWITCHING SPEED
- LOW BASE-DRIVE REQUIREMENTS
- U.L. RECOGNISED ISOWATT218 PACKAGE (U.L. FILE # E81734 (N))

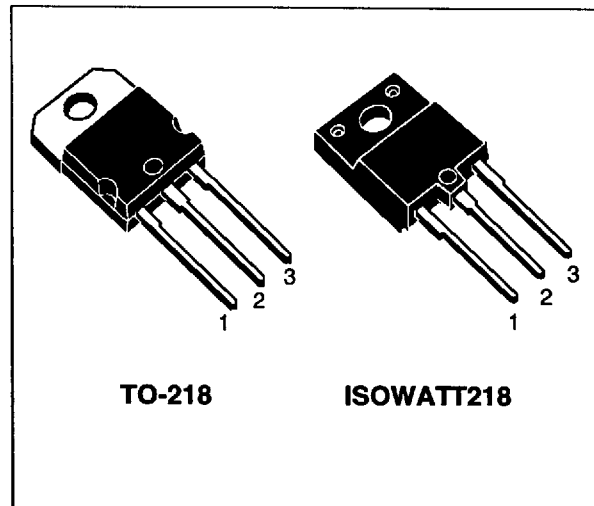
APPLICATIONS:

- SWITCH MODE POWER SUPPLIES
- HORIZONTAL DEFLECTION FOR COLOUR TVS AND MONITORS

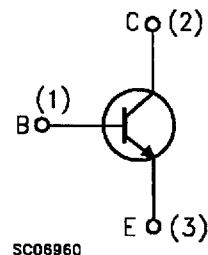
DESCRIPTION

The SGSF464 and SGSIF464 are manufactured using Multiepitaxial Mesa technology for cost-effective high performance and uses a Hollow Emitter structure to enhance switching speeds.

The SGSF series is designed for high speed switching applications such as power supplies and horizontal deflection circuits in TVs and monitors.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	1200		V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	600		V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7		V
I_C	Collector Current	10		A
I_{CM}	Collector Peak Current ($t_p < 5$ ms)	15		A
I_B	Base Current	7		A
I_{BM}	Base Peak Current ($t_p < 5$ ms)	12		A
P_{tot}	Total Dissipation at $T_c = 25^\circ\text{C}$	125	57	W
T_{stg}	Storage Temperature	-65 to 150		$^\circ\text{C}$
T_j	Max. Operating Junction Temperature	150		$^\circ\text{C}$

THERMAL DATA

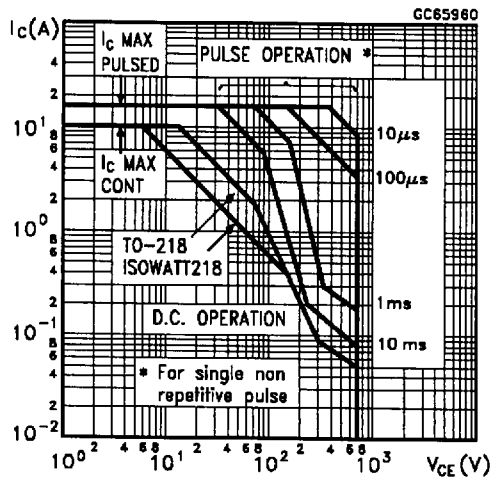
			TO-218	ISOWATT218	
$R_{thj-case}$	Thermal Resistance Junction-Case	Max	1	2.2	$^{\circ}\text{C/W}$
$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	30		$^{\circ}\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

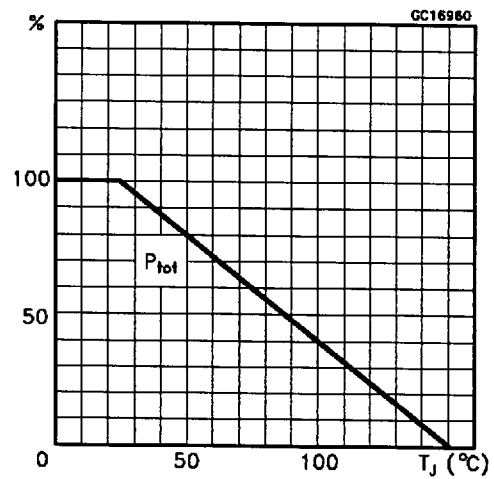
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current ($V_{BE} = 0$)	$V_{CE} = 1200\text{ V}$			200	μA
I_{CEO}	Collector Cut-off Current ($I_B = 0$)	$V_{EC} = 380\text{ V}$ $V_{EC} = 600\text{ V}$			200 2	μA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{BE} = 7\text{ V}$			1	mA
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage	$I_C = 100\text{ mA}$	600			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 6\text{ A}$ $I_B = 1.2\text{ A}$ $I_C = 3.5\text{ A}$ $I_B = 0.5\text{ A}$			1.5 1.5	V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 6\text{ A}$ $I_B = 1.2\text{ A}$ $I_C = 3.5\text{ A}$ $I_B = 0.5\text{ A}$			1.5 1.5	V V
t_{ON} t_s t_f	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD $V_{CC} = 250\text{ V}$ $I_C = 6\text{ A}$ $I_{B1} = 1\text{ A}$ $I_{B1} = -2\text{ A}$		0.6 2.45 0.12	1.2 3.5 0.4	μs μs μs
t_{ON} t_s t_f	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD $V_{CC} = 250\text{ V}$ $I_C = 5\text{ A}$ $I_{B1} = 1\text{ A}$ $I_{B1} = -2\text{ A}$ With Antisaturation Network		0.6 1.7 0.12		μs μs μs
t_{ON} t_s t_f	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD $V_{CC} = 250\text{ V}$ $I_C = 5\text{ A}$ $I_{B1} = 1\text{ A}$ $V_{BE(off)} = -5\text{ V}$		0.6 1.3 0.2		μs μs μs
t_s t_f	Storage Time Fall Time	INDUCTIVE LOAD $I_C = 5\text{ A}$ $h_{FE} = 5$ $V_{CL} = 450\text{ V}$ $V_{BE(off)} = -5\text{ V}$ $L = 300\text{ }\mu\text{H}$ $R_{BB} = 0.8\text{ }\Omega$		1.4 0.1	2.8 0.2	μs μs
t_s t_f	Storage Time Fall Time	INDUCTIVE LOAD $I_C = 5\text{ A}$ $h_{FE} = 5$ $V_{CL} = 450\text{ V}$ $V_{BE(off)} = -5\text{ V}$ $L = 300\text{ }\mu\text{H}$ $R_{BB} = 0.8\text{ }\Omega$ $T_c = 100^{\circ}\text{C}$			4 0.3	μs μs

* Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

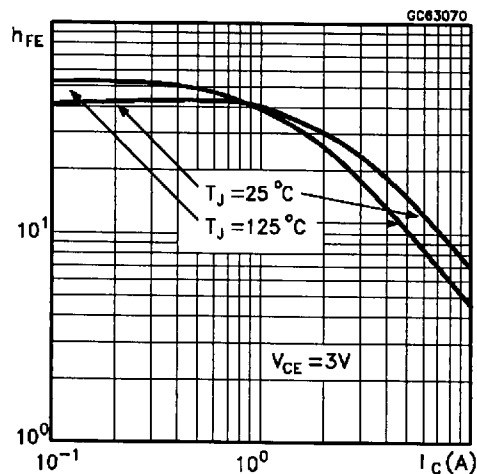
Safe Operating Area Thermal Impedance



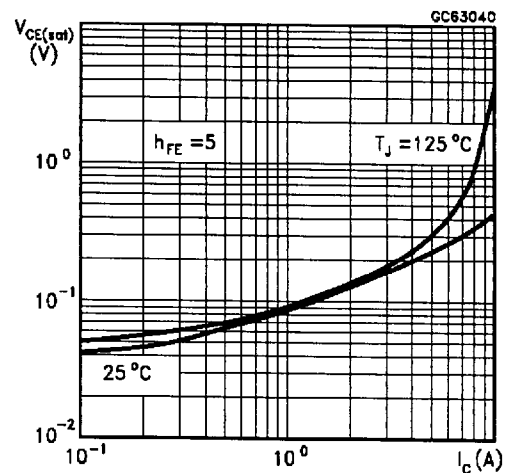
Derating Curve



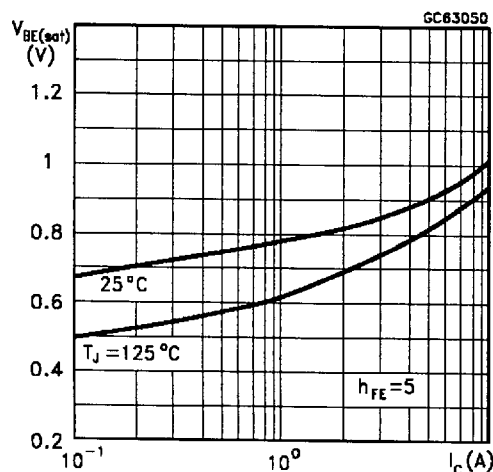
DC Current Gain



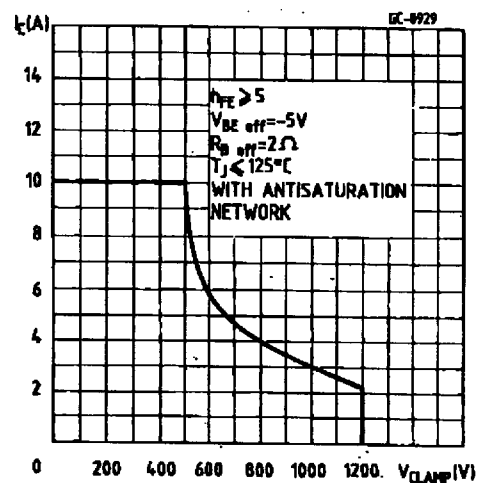
Collector Emitter Saturation Voltage



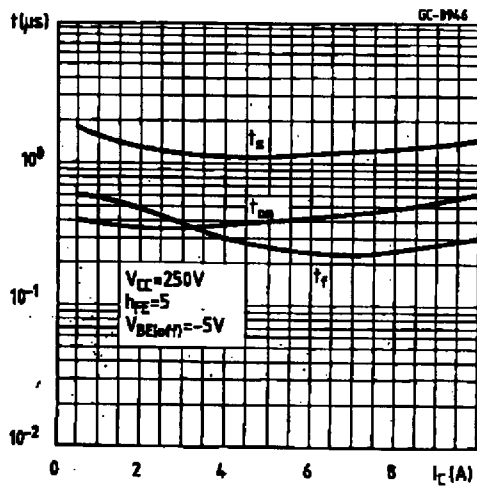
Base Emitter Saturation Voltage



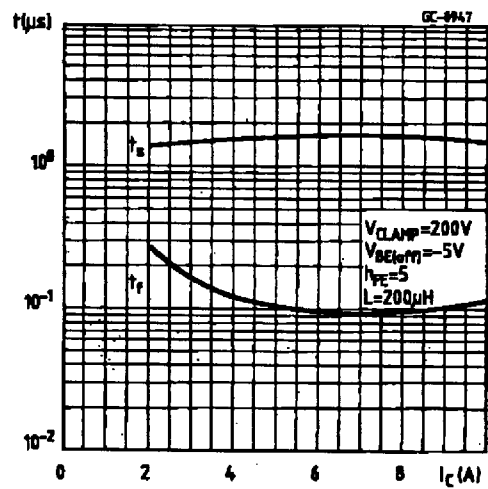
Reverse Biased SOA



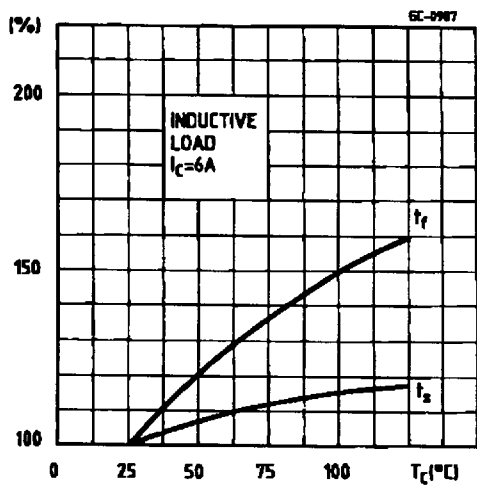
Resistive Load Switching Times



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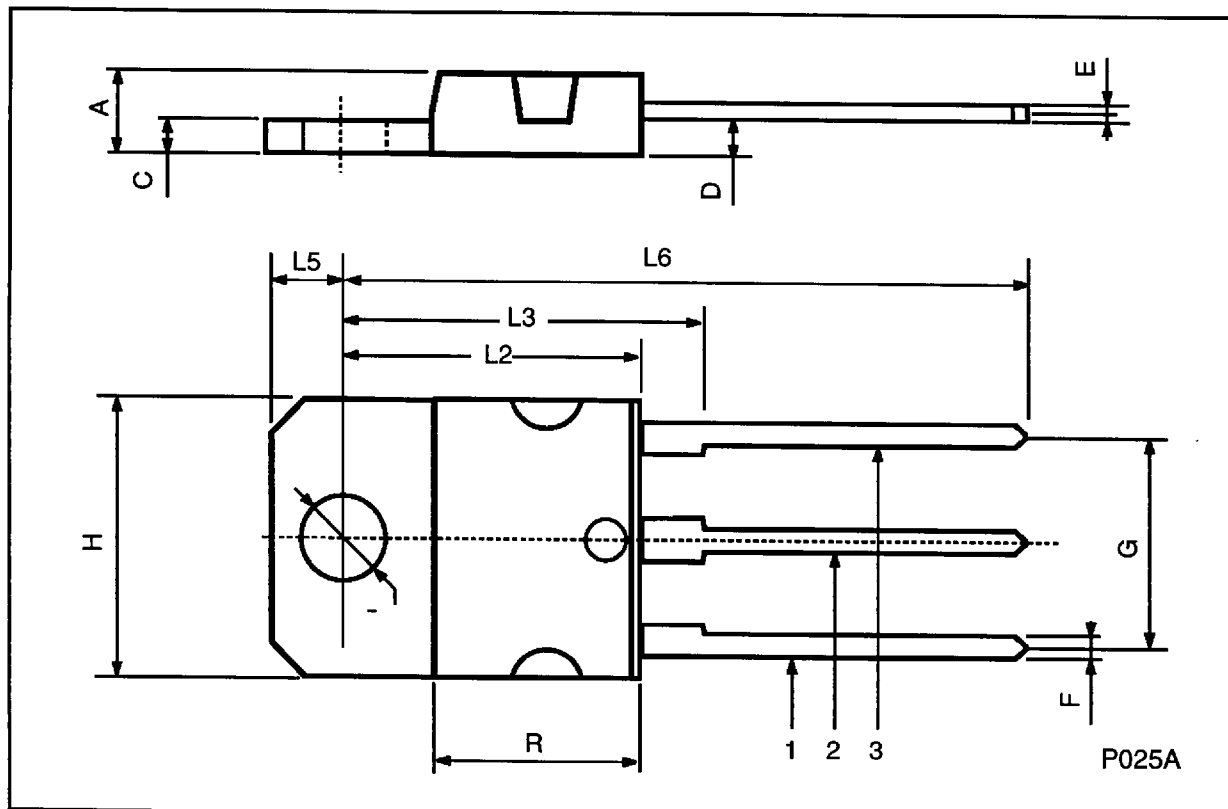


Switching Times Percentance Variation



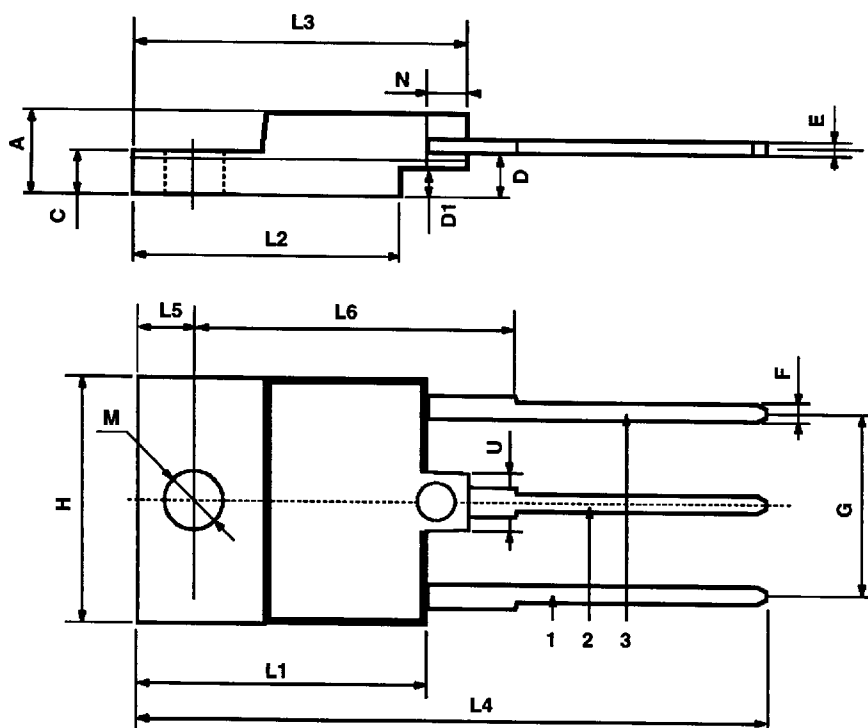
TO-218 (SOT-93) MECHANICAL DATA

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



ISOWATT218 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.35		5.65	0.210		0.222
C	3.3		3.8	0.130		0.149
D	2.9		3.1	0.114		0.122
D1	1.88		2.08	0.074		0.081
E	0.75		1	0.029		0.039
F	1.05		1.25	0.041		0.049
G	10.8		11.2	0.425		0.441
H	15.8		16.2	0.622		0.637
L1	20.8		21.2	0.818		0.834
L2	19.1		19.9	0.752		0.783
L3	22.8		23.6	0.897		0.929
L4	40.5		42.5	1.594		1.673
L5	4.85		5.25	0.190		0.206
L6	20.25		20.75	0.797		0.817
M	3.5		3.7	0.137		0.145
N	2.1		2.3	0.082		0.090
U		4.6			0.181	



P025C