

## HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTORS

- SGSIF344 IS SGS-THOMSON PREFERRED SALESTYPE
- HIGH VOLTAGE CAPABILITY
- VERY HIGH SWITCHING SPEED
- LOW BASE-DRIVE REQUIREMENTS

**APPLICATIONS:**

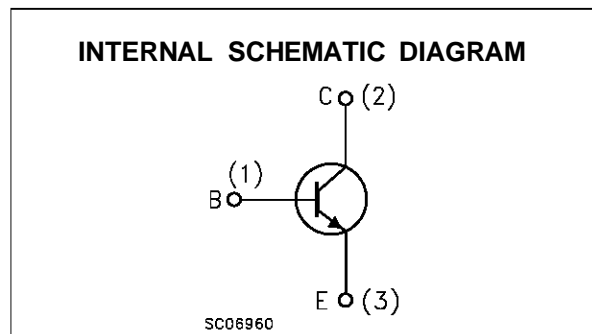
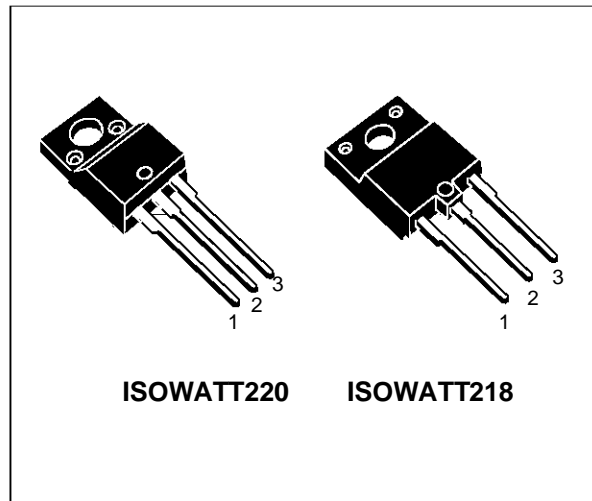
- SWITCH MODE POWER SUPPLIES
- HORIZONTAL DEFLECTION FOR COLOUR TVS AND MONITORS

**DESCRIPTION**

The SGSIF344 and SGSIF444 are manufactured using Multiepitaxial Mesa technology for cost-effective high performance and uses a Hollow Emitter structure to enhance switching speeds.

These transistors are available in ISOWATT220 and ISOWATT218 plastic package respectively.

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



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value		Unit
		SGSIF344	SGSIF444	
$V_{CES}$	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	7		A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	12		A
$I_B$	Base Current	5		A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms)	8		A
$P_{tot}$	Total Dissipation at $T_c = 25^\circ\text{C}$	40	50	W
$T_{stg}$	Storage Temperature	-65 to 150		$^\circ\text{C}$
$T_j$	Max. Operating Junction Temperature	150		$^\circ\text{C}$

**THERMAL DATA**

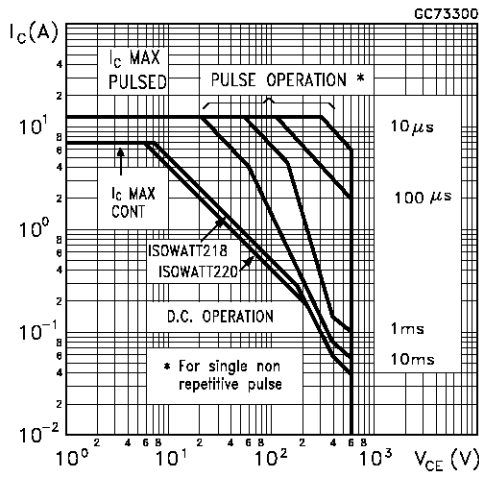
			<b>ISOWATT220</b>	<b>ISOWATT218</b>	°C/W
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	3.12	2.5	°C/W

**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

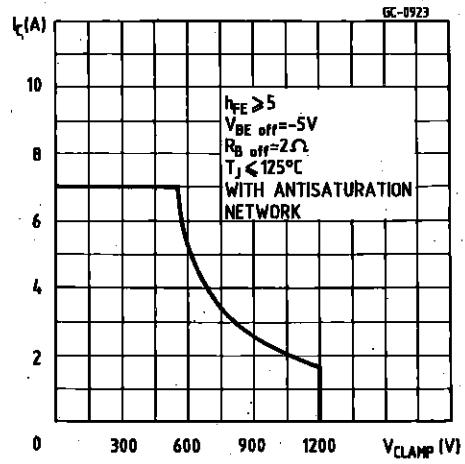
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 1200 V			200	μA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>EC</sub> = 380 V V <sub>EC</sub> = 600 V			200 2	μA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>BE</sub> = 7 V			1	mA
V <sub>CEO(sus)*</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 100 mA	600			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 3.5 A I <sub>B</sub> = 0.7 A I <sub>C</sub> = 2.5 A I <sub>B</sub> = 0.35 A			1.5 1.5	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 3.5 A I <sub>B</sub> = 0.7 A I <sub>C</sub> = 2.5 A I <sub>B</sub> = 0.35 A			1.5 1.5	V V
t <sub>ON</sub> t <sub>s</sub> t <sub>f</sub>	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD V <sub>CC</sub> = 250 V I <sub>C</sub> = 3.5 A I <sub>B1</sub> = 0.7 A I <sub>B1</sub> = -1.4 A		0.7 2.2 0.18	1.2 3.5 0.4	μs μs μs
t <sub>ON</sub> t <sub>s</sub> t <sub>f</sub>	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD V <sub>CC</sub> = 250 V I <sub>C</sub> = 3.5 A I <sub>B1</sub> = 0.7 A I <sub>B1</sub> = -1.4 A With Antisaturation Network		0.7 1.5 0.2		μs μs μs
t <sub>ON</sub> t <sub>s</sub> t <sub>f</sub>	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD V <sub>CC</sub> = 250 V I <sub>C</sub> = 3.5 A I <sub>B1</sub> = 0.7 A V <sub>BE(off)</sub> = -5 V		0.7 1 0.2		μs μs μs
t <sub>s</sub> t <sub>f</sub>	Storage Time Fall Time	INDUCTIVE LOAD I <sub>C</sub> = 3.5 A h <sub>FE</sub> = 5 V <sub>CL</sub> = 450 V V <sub>BE(off)</sub> = -5 V L = 300 μH R <sub>BB</sub> = 1.2 Ω		1.4 0.1	2.8 0.2	μs μs
t <sub>s</sub> t <sub>f</sub>	Storage Time Fall Time	INDUCTIVE LOAD I <sub>C</sub> = 3.5 A h <sub>FE</sub> = 5 V <sub>CL</sub> = 450 V V <sub>BE(off)</sub> = -5 V L = 300 μH R <sub>BB</sub> = 1.2 Ω T <sub>c</sub> = 100 °C			4 0.3	μs μs

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

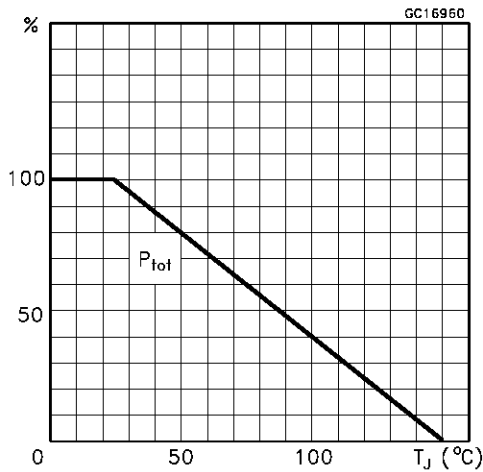
Safe Operating Area



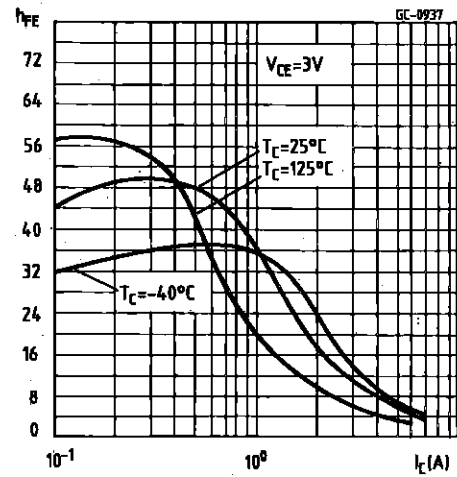
Reverse Biased SOA



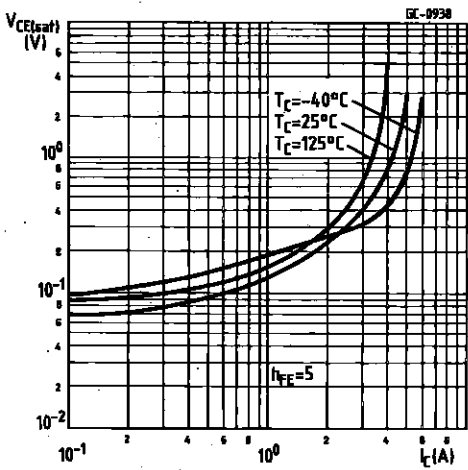
Derating Curve



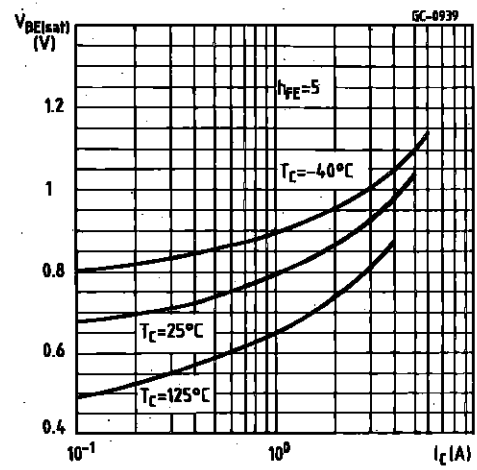
DC Current Gain



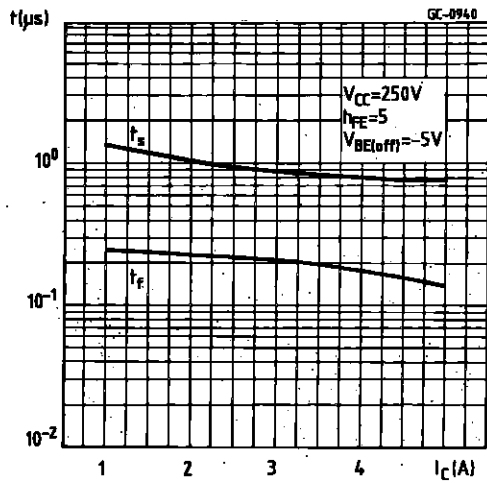
Collector Emitter Saturation Voltage



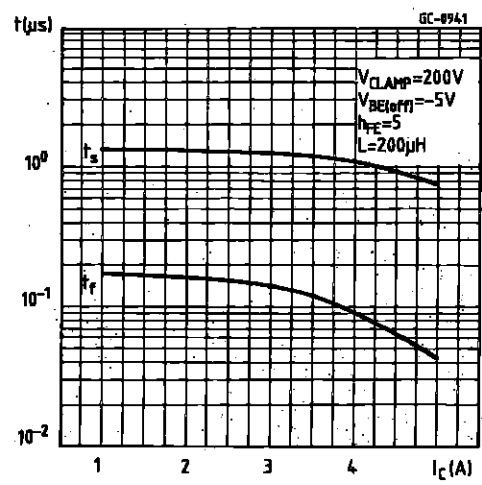
Base Emitter Saturation Voltage



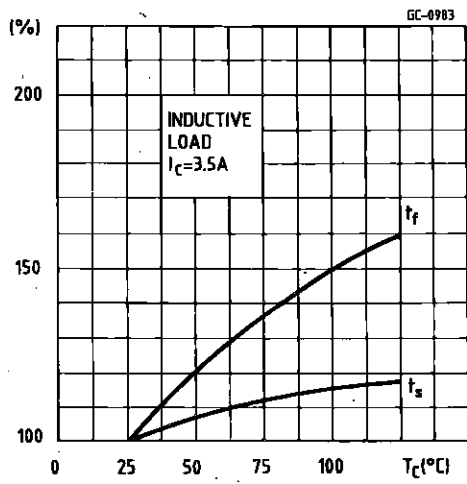
Resistive Load Switching Times



Inductive Load Switching Times

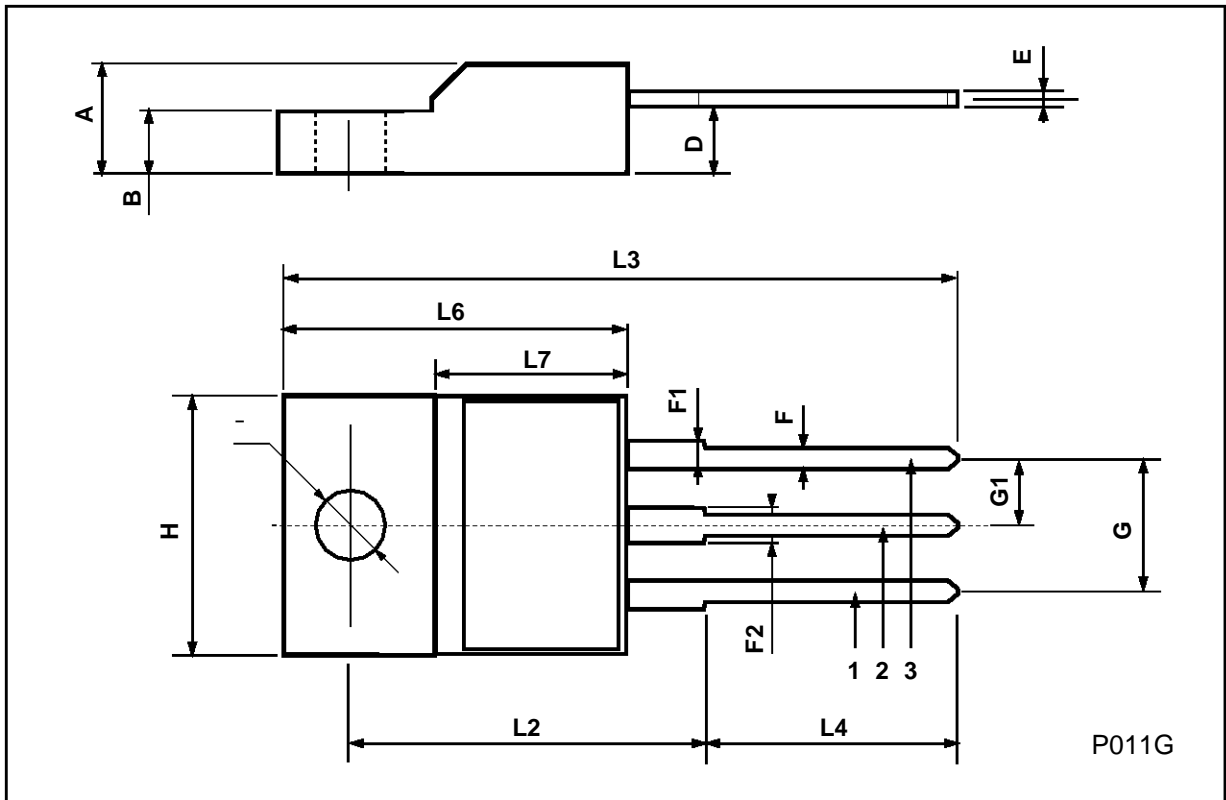


Switching Times Percentance Variation



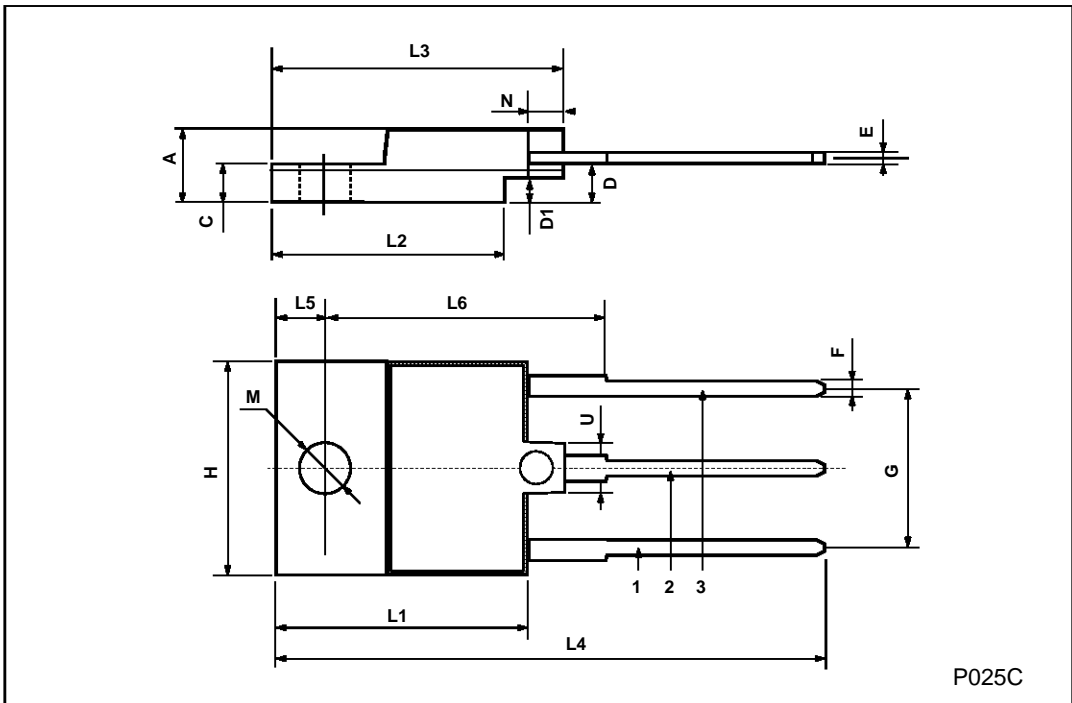
**ISOWATT220 MECHANICAL DATA**

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.4		0.7	0.015		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.7	0.045		0.067
F2	1.15		1.7	0.045		0.067
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
H	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
Ø	3		3.2	0.118		0.126



**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	



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