

## FAST-SWITCH HOLLOW-EMITTER NPN TRANSISTOR

- VERY HIGH SWITCHING SPEED
- NPN TRANSISTOR
- LOW BASE-DRIVE REQUIREMENTS

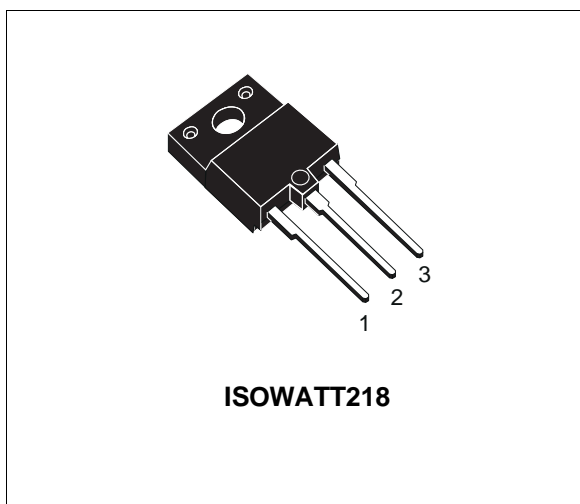
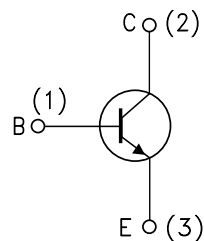
**APPLICATIONS:**

- SWITCH MODE POWER SUPPLIES

**DESCRIPTION**

The SGSIF461 is manufactured using Multi-epitaxial Mesa technology for cost-effective high performance and uses a Hollow Emitter structure to enhance switching speeds.

The SGSIF 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 ( $V_{BE} = 0$ )	850	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	400	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_C$	Collector Current	15	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	25	A
$I_B$	Base Current	8	A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms)	15	A
$P_{tot}$	Total Dissipation at $T_c = 25$ °C	55	W
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

**THERMAL DATA**

		<b>ISOWATT218</b>	
$R_{thj-case}$	Thermal Resistance Junction-Case	Max	2.2 °C/W

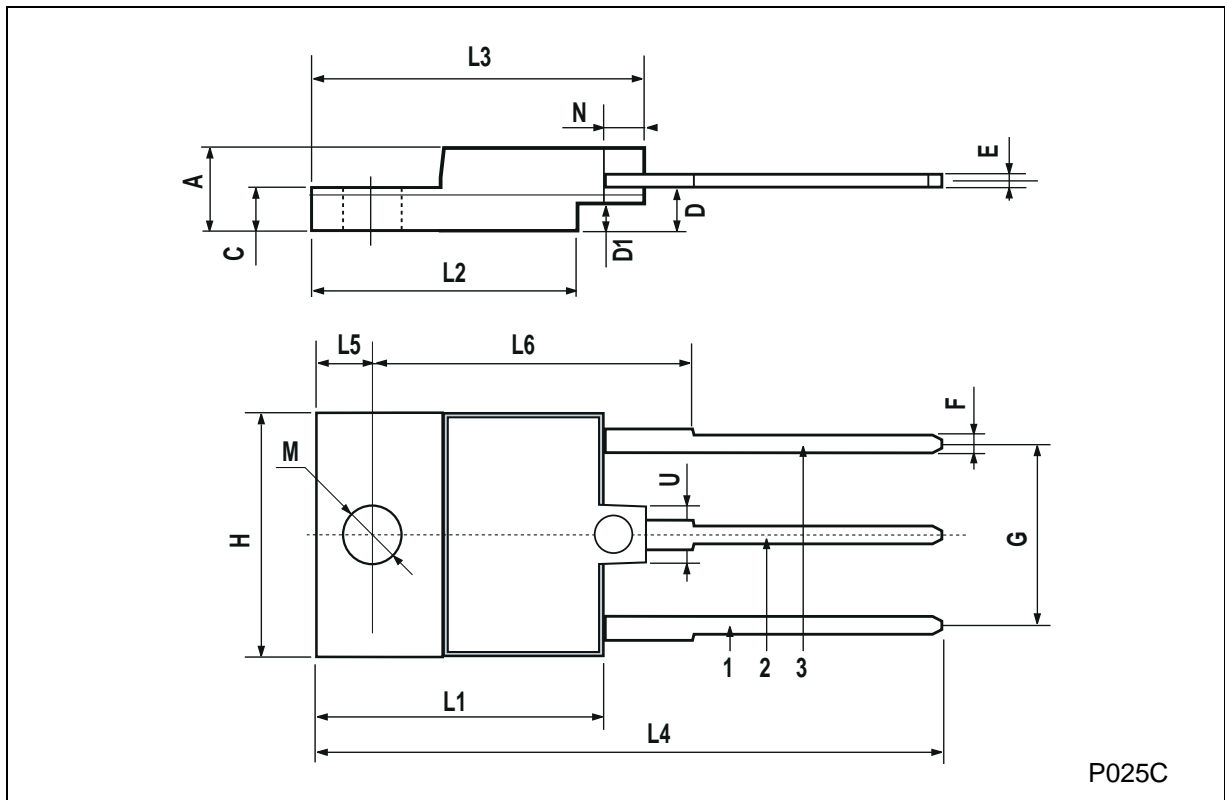
**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 700\text{ V}$			200	$\mu\text{A}$
$I_{CEO}$	Collector Cut-off Current ( $I_B = 0$ )	$V_{EC} = 380\text{ V}$ $V_{EC} = 400\text{ V}$			200 2	$\mu\text{A}$ $\text{mA}$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{BE} = 7\text{ V}$			1	$\text{mA}$
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage	$I_C = 100\text{ mA}$	400			$\text{V}$
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 10\text{ A}$ $I_B = 2\text{ A}$ $I_C = 5.5\text{ A}$ $I_B = 0.8\text{ A}$			1.5 1.5	$\text{V}$ $\text{V}$
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 10\text{ A}$ $I_B = 2\text{ A}$ $I_C = 5.5\text{ A}$ $I_B = 0.8\text{ A}$			1.5 1.5	$\text{V}$ $\text{V}$
$t_{ON}$ $t_s$ $t_f$	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD $V_{CC} = 250\text{ V}$ $I_C = 10\text{ A}$ $I_{B1} = 2\text{ A}$ $I_{B2} = -2I_{B1}$		1 1.4 0.25	1.7 2.3 0.5	$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_{ON}$ $t_s$ $t_f$	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD $V_{CC} = 250\text{ V}$ $I_C = 10\text{ A}$ $I_{B1} = 2\text{ A}$ $I_{B2} = -2I_{B1}$ With Antisaturation Network		1 1 0.15		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_{ON}$ $t_s$ $t_f$	Turn-on Time Storage Time Fall Time	RESISTIVE LOAD $V_{CC} = 250\text{ V}$ $I_C = 10\text{ A}$ $I_{B1} = 2\text{ A}$ $V_{BE(off)} = -5\text{ V}$		1 1 0.06		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Storage Time Fall Time	INDUCTIVE LOAD $I_C = 10\text{ A}$ $h_{FE} = 5$ $V_{CL} = 350\text{ V}$ $V_{BE(off)} = -5\text{ V}$ $L = 300\text{ }\mu\text{H}$ $R_{BE(off)} = 1.2\text{ }\Omega$		1.4 0.1	2.8 0.2	$\mu\text{s}$ $\mu\text{s}$
$t_s$ $t_f$	Storage Time Fall Time	INDUCTIVE LOAD $I_C = 10\text{ A}$ $h_{FE} = 5$ $V_{CL} = 350\text{ V}$ $V_{BE(off)} = -5\text{ V}$ $L = 300\text{ }\mu\text{H}$ $R_{BE(off)} = 1.2\text{ }\Omega$ $T_c = 100\text{ °C}$			4 0.3	$\mu\text{s}$ $\mu\text{s}$

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5 %

**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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