



## ST2009DHI

# HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTOR

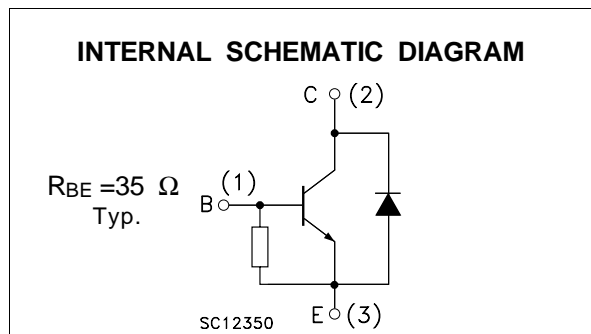
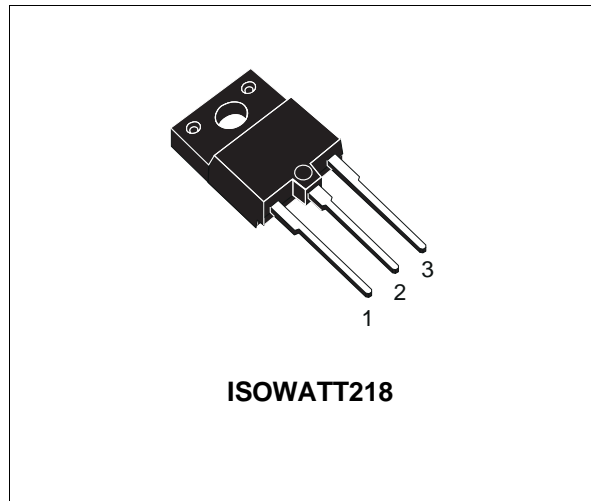
- NEW SERIES, ENHANCED PERFORMANCE
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING
- INTEGRATED FREE WHEELING DIODE
- HIGH VOLTAGE CAPABILITY
- HIGH SWITCHING SPEED
- TIGHTER  $h_{fe}$  CONTROL
- IMPROVED RUGGEDNESS

### APPLICATIONS:

- HORIZONTAL DEFLECTION FOR COLOR TVS

### DESCRIPTION

The device is manufactured using Diffused Collector technology for more stable operation Vs base drive circuit variations resulting in very low worst case dissipation.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	1500	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)	20	A
$I_B$	Base Current	7	A
$P_{tot}$	Total Dissipation at $T_c = 25$ °C	55	W
$V_{isol}$	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	2500	V
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

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## THERMAL DATA

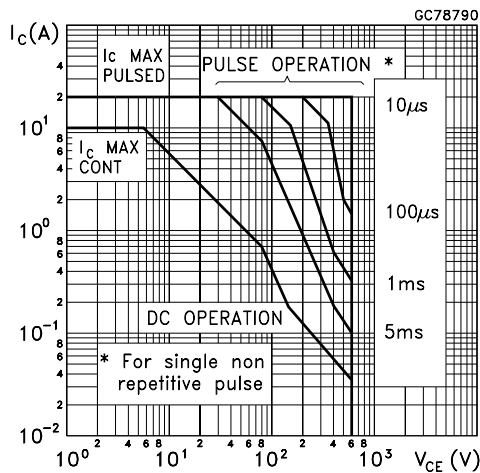
R <sub>thj-case</sub>	Thermal Resistance Junction-case	Max	2.3	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

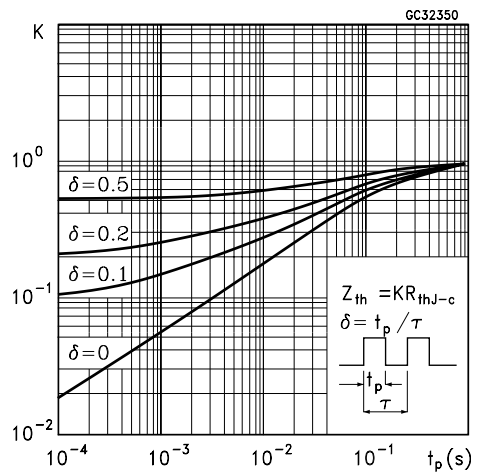
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>CES</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> = 1500 V V <sub>CE</sub> = 1500 V T <sub>C</sub> = 125 °C			1 2	mA mA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = 4 V	70		210	mA
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 5 A I <sub>B</sub> = 1.25 A			1.5	V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 5 A I <sub>B</sub> = 1.25 A			1.2	V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = 1 A V <sub>CE</sub> = 5 V I <sub>C</sub> = 5 A V <sub>CE</sub> = 1 V I <sub>C</sub> = 5.5 A V <sub>CE</sub> = 5 V	5	20 5	9	
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 5 A		1.5	2	V
t <sub>s</sub> t <sub>f</sub>	INDUCTIVE LOAD Storage Time Fall Time	I <sub>C</sub> = 5 A I <sub>Bon(END)</sub> = 1 A L <sub>BB(off)</sub> = 2 μH V <sub>BE(off)</sub> = -2.5 V f = 32 KHz		2.6 0.28	3.2 0.55	μs μs

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

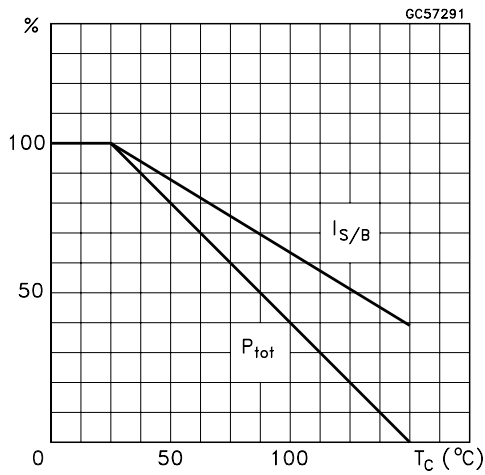
## Safe Operating Area



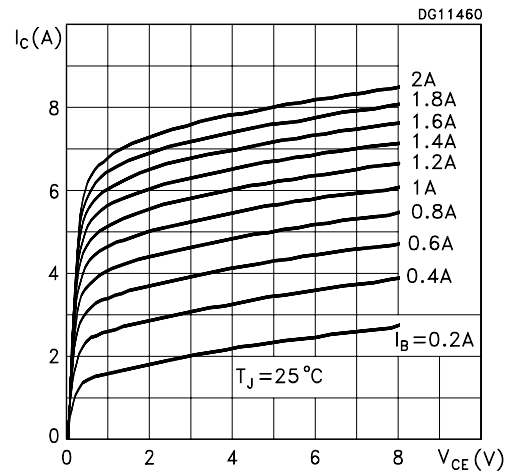
## Thermal Impedance



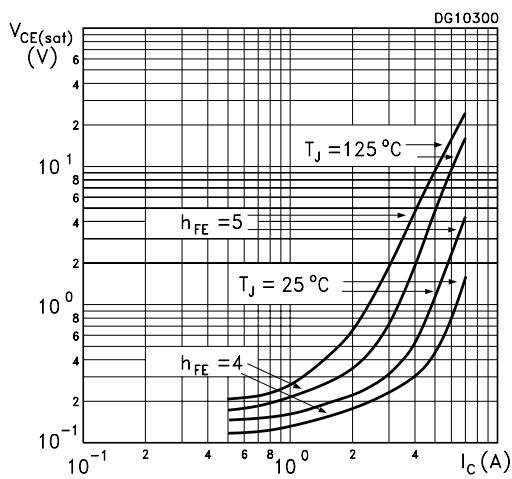
Derating Curve



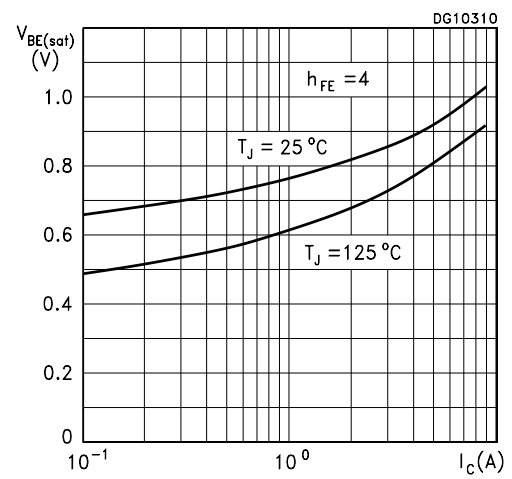
Output Characteristics



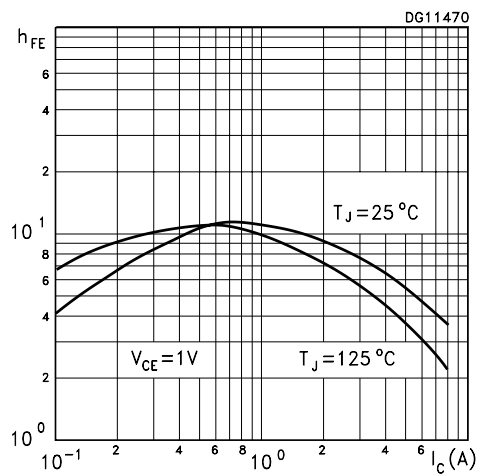
Collector Emitter Saturation Voltage



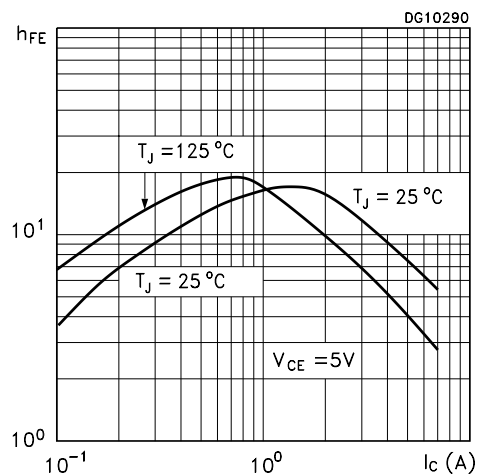
Base Emitter Saturation Voltage



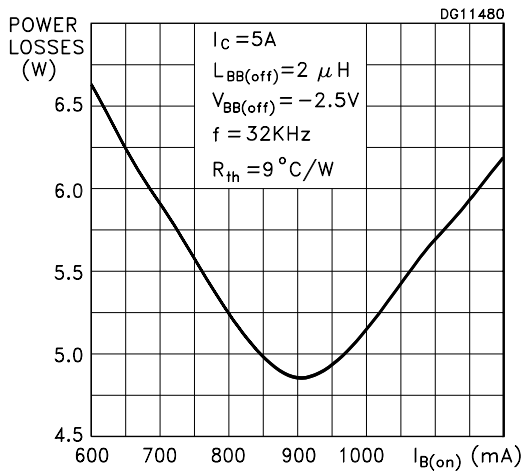
DC Current Gain



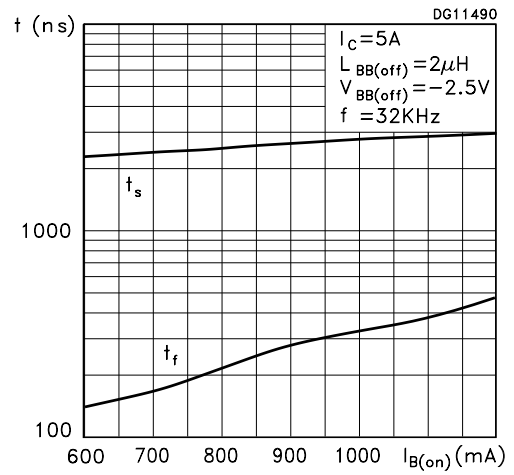
DC Current Gain



Power Losses



Switching Time Inductive Load



RBSOA

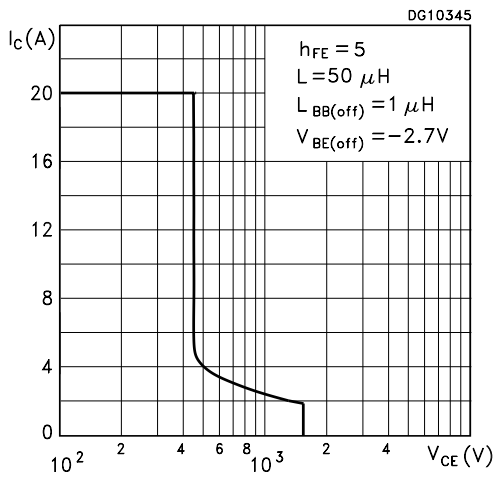
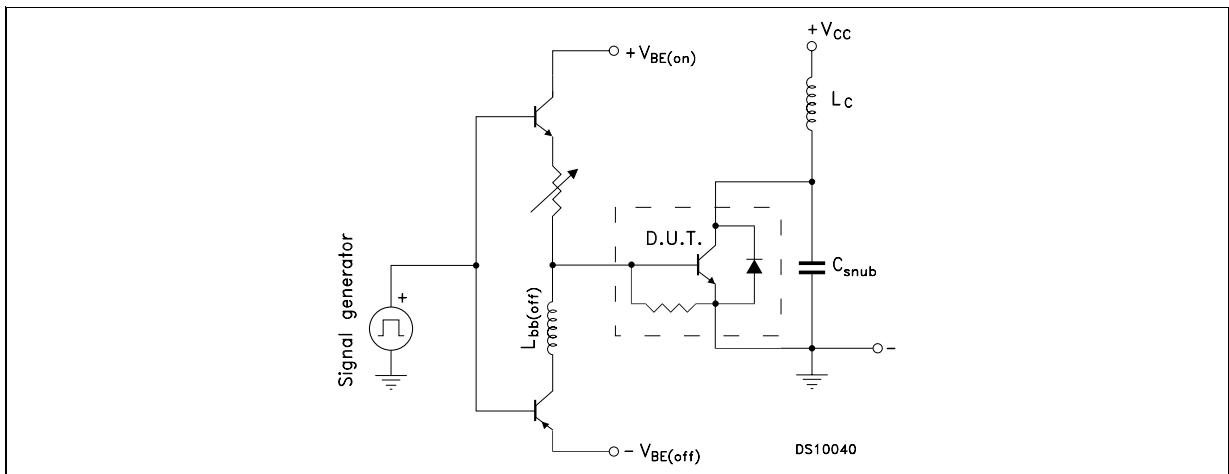
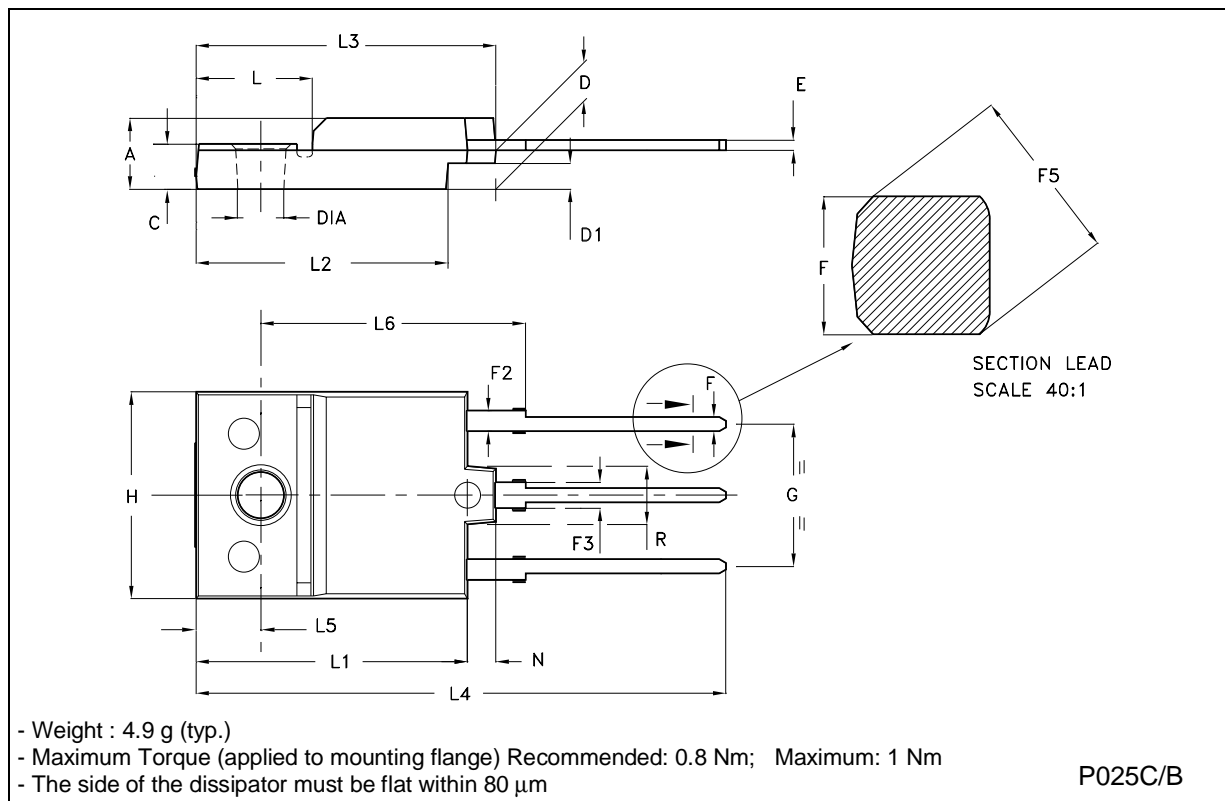


Figure 1: Inductive Load Switching Test Circuit.



## ISOWATT218 NARROW LEADS MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.35		5.65	0.211		0.222
C	3.30		3.80	0.130		0.150
D	2.90		3.10	0.114		0.122
D1	1.88		2.08	0.074		0.082
E	0.75		0.95	0.030		0.037
F	0.75		0.95	0.030		0.037
F2	1.50		1.70	0.059		0.067
F3	1.90		2.10	0.075		0.083
F5			1.10			0.043
G	10.80		11.20	0.425		0.441
H	15.80		16.20	0.622		0.638
L		9			0.354	
L1	20.80		21.20	0.819		0.835
L2	19.10		19.90	0.752		0.783
L3	22.80		23.60	0.898		0.929
L4	40.50		42.50	1.594		1.673
L5	4.85		5.25	0.191		0.207
L6	20.25		20.75	0.797		0.817
N	2.1		2.3	0.083		0.091
R		4.6			0.181	
DIA	3.5		3.7	0.138		0.146



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