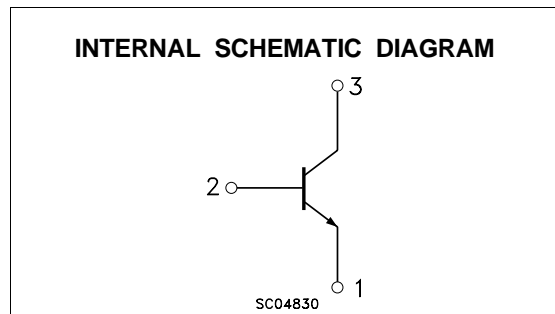
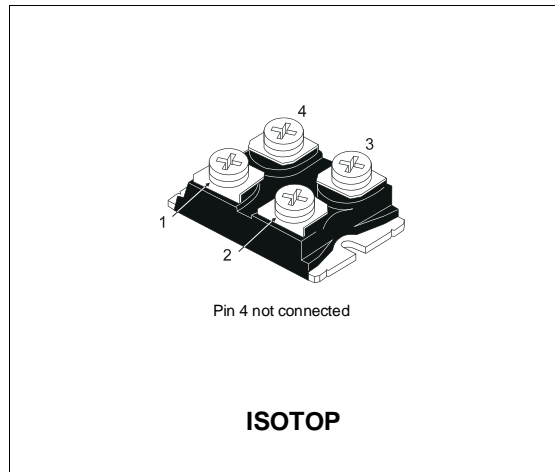


NPN TRANSISTOR POWER MODULE

- HIGH CURRENT POWER BIPOLAR MODULE
- VERY LOW R_{th} JUNCTION CASE
- SPECIFIED ACCIDENTAL OVERLOAD AREAS
- INSULATED CASE (2500V RMS)
- EASY TO MOUNT
- LOW INTERNAL PARASITIC INDUCTANCE

INDUSTRIAL APPLICATIONS:

- MOTOR CONTROL
- SMPS & UPS
- WELDING EQUIPMENT



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEV}	Collector-Emitter Voltage ($V_{BE} = -5$ V)	1000	V
$V_{CEO(sus)}$	Collector-Emitter Voltage ($I_B = 0$)	450	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	50	A
I_{CM}	Collector Peak Current ($t_p = 10$ ms)	75	A
I_B	Base Current	10	A
I_{BM}	Base Peak Current ($t_p = 10$ ms)	16	A
P_{tot}	Total Dissipation at $T_C = 25$ °C	250	W
T_{stg}	Storage Temperature	-55 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C
V_{ISO}	Insulation Withstand Voltage (AC-RMS)	2500	°C

THERMAL DATA

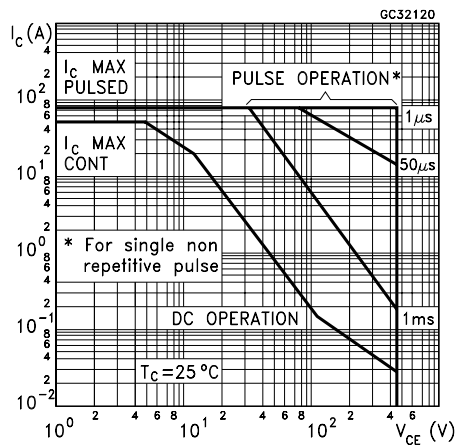
$R_{thj-case}$	Thermal Resistance Junction-case	Max	0.5	°C/W
R_{thc-h}	Thermal Resistance Case-heatsink With Conductive Grease Applied	Max	0.05	°C/W

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

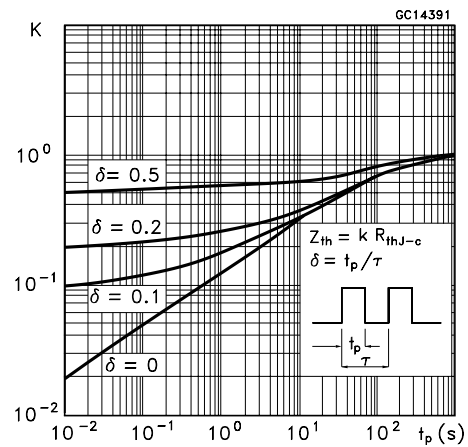
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CER}	Collector Cut-off Current ($R_{BE} = 5\ \Omega$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV}$ $T_j = 100\text{ °C}$			0.4 2	mA mA
I_{CEV}	Collector Cut-off Current ($V_{BE} = -5V$)	$V_{CE} = V_{CEV}$ $V_{CE} = V_{CEV}$ $T_j = 100\text{ °C}$			0.4 2	mA mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			2	mA
$V_{CEO(sus)*}$	Collector-Emitter Sustaining Voltage	$I_C = 0.2\text{ A}$ $L = 25\text{ mH}$ $V_{clamp} = 450\text{ V}$	450			V
h_{FE*}	DC Current Gain	$I_C = 32\text{ A}$ $V_{CE} = 5\text{ V}$		12		
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 32\text{ A}$ $I_B = 6.4\text{ A}$ $I_C = 32\text{ A}$ $I_B = 6.4\text{ A}$ $T_j = 100\text{ °C}$		0.35 0.6	1.2 2	V V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 32\text{ A}$ $I_B = 6.4\text{ A}$ $I_C = 32\text{ A}$ $I_B = 6.4\text{ A}$ $T_j = 100\text{ °C}$		1 0.9	1.5 1.5	V V
di_C/dt	Rate of Rise of On-state Collector	$V_{CC} = 300\text{ V}$ $R_C = 0$ $t_p = 3\ \mu s$ $I_{B1} = 9.6\text{ A}$ $T_j = 100\text{ °C}$	160	210		A/ μs
$V_{CE(3\ \mu s)}$	Collector-Emitter Dynamic Voltage	$V_{CC} = 300\text{ V}$ $R_C = 9.3\ \Omega$ $I_{B1} = 9.6\text{ A}$ $T_j = 100\text{ °C}$		4.5	8	V
$V_{CE(5\ \mu s)}$	Collector-Emitter Dynamic Voltage	$V_{CC} = 300\text{ V}$ $R_C = 9.3\ \Omega$ $I_{B1} = 9.6\text{ A}$ $T_j = 100\text{ °C}$		2.5	4	V
t_s	Storage Time	$I_C = 32\text{ A}$ $V_{CC} = 50\text{ V}$		2.2	4.5	μs
t_f	Fall Time	$V_{BB} = -5\text{ V}$ $R_{BB} = 0.39\ \Omega$		0.2	0.4	μs
t_c	Cross-over Time	$V_{clamp} = 450\text{ V}$ $I_{B1} = 6.4\text{ A}$ $L = 78\ \mu H$ $T_j = 100\text{ °C}$		0.45	0.7	μs
V_{CEW}	Maximum Collector Emitter Voltage Without Snubber	$I_{C\text{Woff}} = 48\text{ A}$ $I_{B1} = 6.4\text{ A}$ $V_{BB} = -5\text{ V}$ $V_{CC} = 50\text{ V}$ $L = 52\ \mu H$ $R_{BB} = 0.39\ \Omega$ $T_j = 125\text{ °C}$	450			V

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

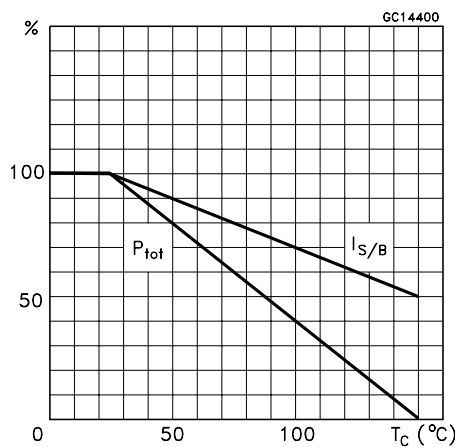
Safe Operating Areas



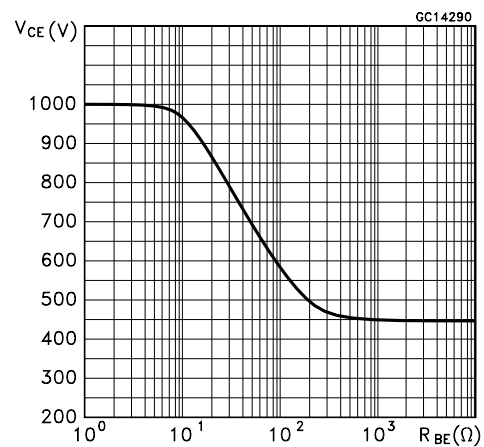
Thermal Impedance



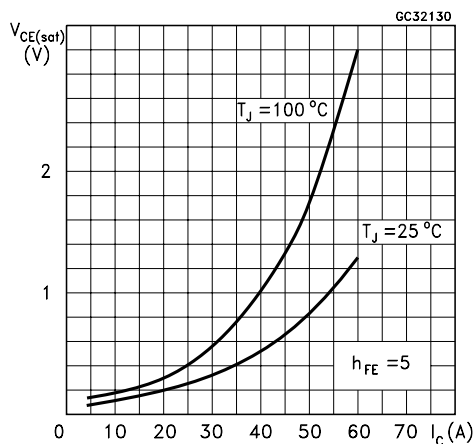
Derating Curve



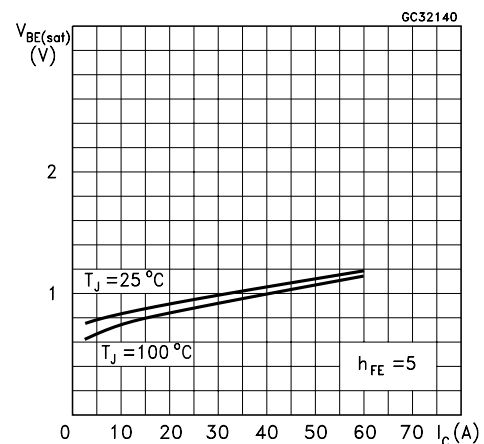
Collector Emitter Voltage Versus Base Emitter Resistance



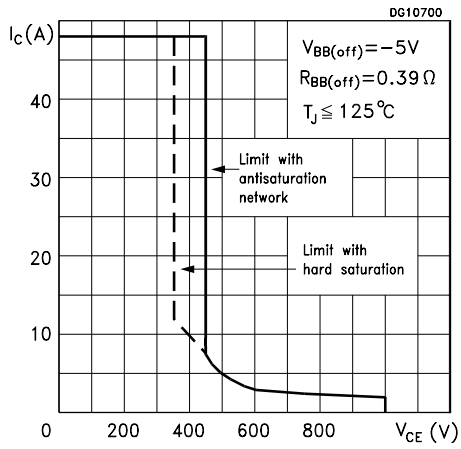
Collector Emitter Saturation Voltage



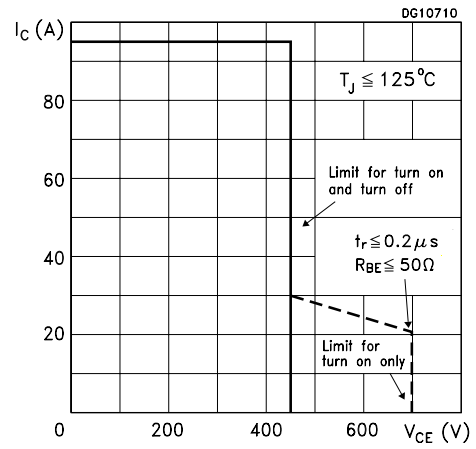
Base Emitter Saturation Voltage



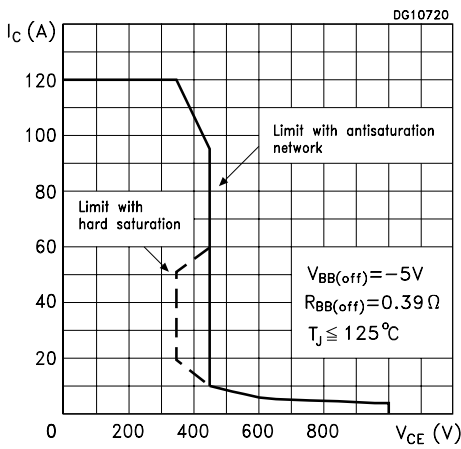
Reverse Biased SOA



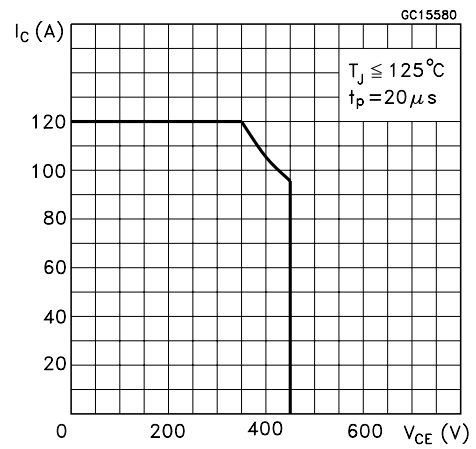
Forward Biased SOA



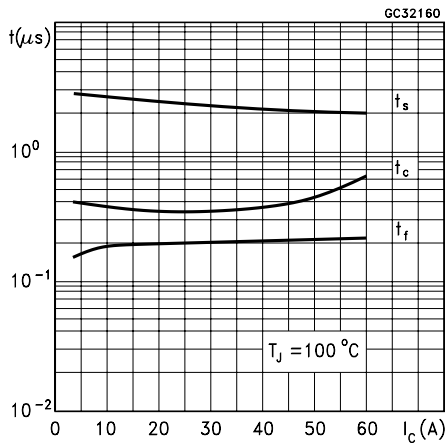
Reverse Biased AOA



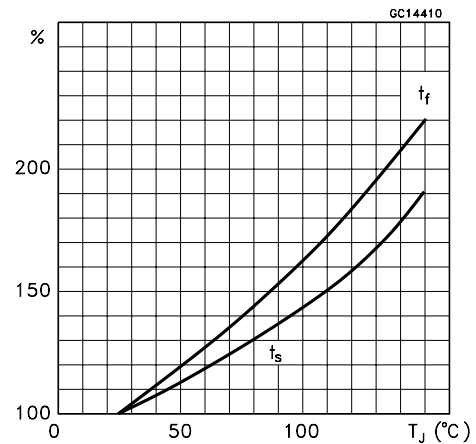
Forward Biased AOA



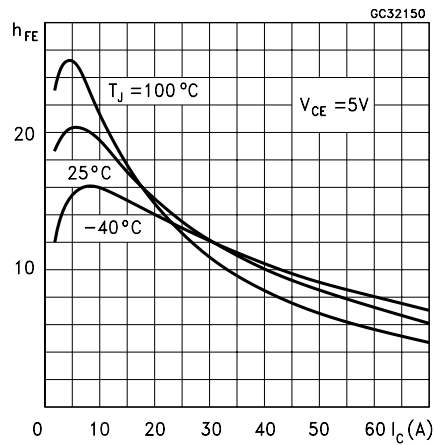
Switching Times Inductive Load



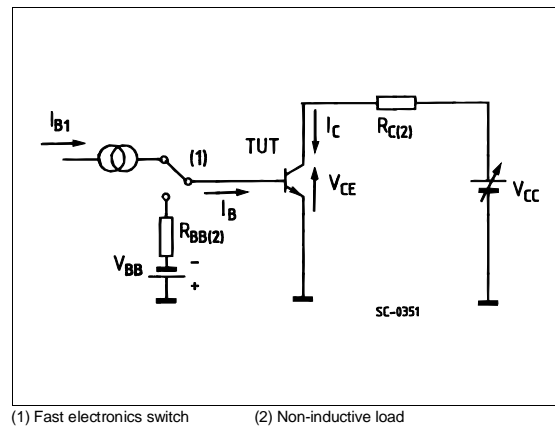
Switching Times Inductive Load Versus Temperature



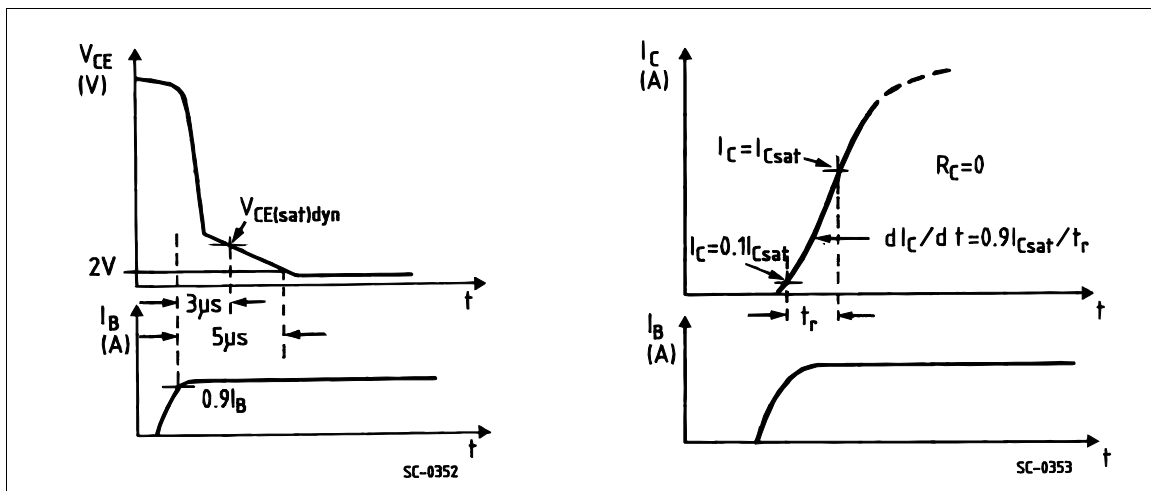
Dc Current Gain



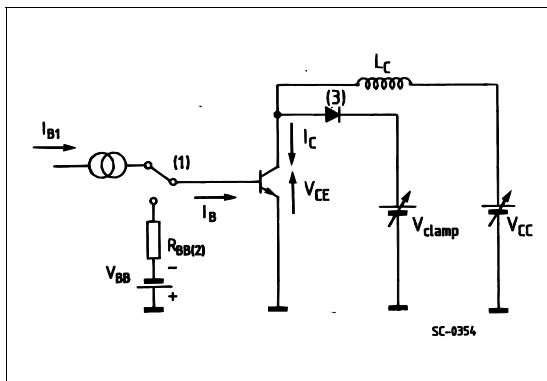
Turn-on Switching Test Circuit



Turn-on Switching Waveforms

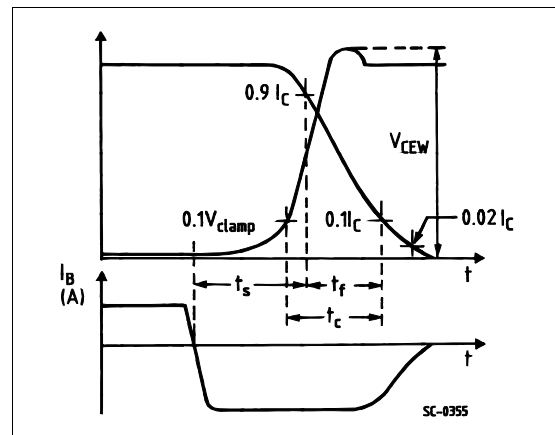


Turn-off Switching Test Circuit



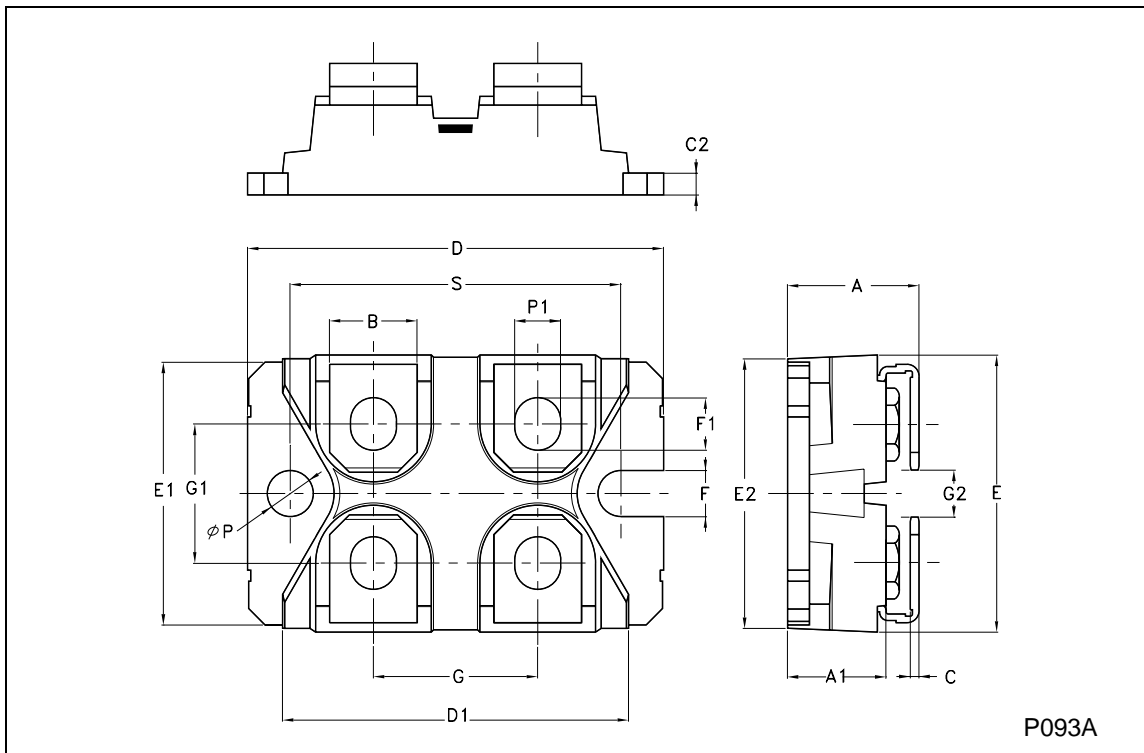
(1) Fast electronic switch (2) Non-inductive load (3) Fast recovery rectifier

Turn-off Switching Waveforms



ISOTOP MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.8		12.2	0.465		0.480
A1	8.9		9.1	0.350		0.358
B	7.8		8.2	0.307		0.322
C	0.75		0.85	0.029		0.033
C2	1.95		2.05	0.076		0.080
D	37.8		38.2	1.488		1.503
D1	31.5		31.7	1.240		1.248
E	25.15		25.5	0.990		1.003
E1	23.85		24.15	0.938		0.950
E2		24.8			0.976	
G	14.9		15.1	0.586		0.594
G1	12.6		12.8	0.496		0.503
G2	3.5		4.3	0.137		1.169
F	4.1		4.3	0.161		0.169
F1	4.6		5	0.181		0.196
P	4		4.3	0.157		0.169
P1	4		4.4	0.157		0.173
S	30.1		30.3	1.185		1.193



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