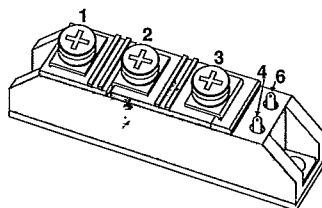


- POWER MODULE WITH INTERNAL ISOLATION (2500V RMS)
- LOW R_{th} JUNCTION TO CASE
- FREEWHEELING DIODE
- ADAPTED FOR HIGH POWER SWITCHING APPLICATIONS

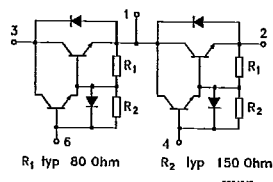
INDUSTRIAL APPLICATIONS:

- MOTOR CONTROL
- HIGH POWER SMPS AND UPS
- HIGH POWER DC/DC AND DC/AC CONVERTERS



TRANSPACK (TO-240)

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	700	V
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	1000	V
V_{CEV}	Collector-Emitter Voltage ($V_{BE} = -2V$)	1000	V
V_{CBO}	Collector-Base Voltage ($I_E = 0$)	1000	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	7	V
I_C	Collector Current	35	A
$-I_C$	Reverse Collector Current	35	A
I_B	Base Current	10	A
$-I_{CSM}$	Collector Surge Current	350	A
P_{tot}	Total Dissipation at $T_c = 25^\circ C$	400	W
T_{stg}	Storage Temperature	-55 to 150	$^\circ C$
T_j	Max. Operating Junction Temperature	150	$^\circ C$
V_{iso}	Insulation Withstand Voltage (AC-RMS)	2500	V

THERMAL DATA

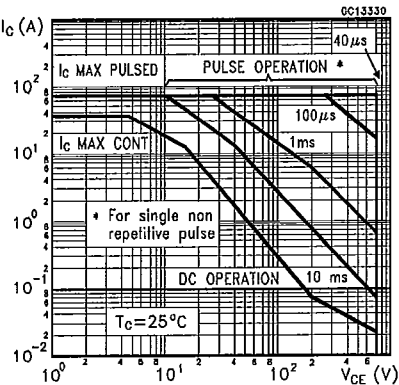
$R_{thj-case}$	Thermal Resistance	Junction-case (quarter bridge)	Max	0.62	$^{\circ}C/W$
$R_{thj-case}$	Thermal Resistance	Junction-case (diode)	Max	1.1	$^{\circ}C/W$
R_{thc-h}	Thermal Resistance	Case-heatsink With Conductive Grease Applied	Max	0.05	$^{\circ}C/W$

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

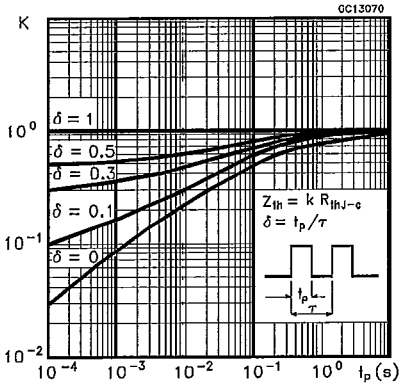
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current ($V_{BE} = 0$)	$V_{CE} = 1000\text{ V}$			2	mA
		$V_{CE} = 700\text{ V}$ $T_J = 125\text{ }^{\circ}C$			10	mA
I_{CEV}	Collector Cut-off Current ($V_{BE} = -2\text{ V}$)	$V_{CE} = 1000\text{ V}$			2	mA
		$V_{CE} = 700\text{ V}$ $T_J = 125\text{ }^{\circ}C$			10	mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 2\text{ V}$			150	mA
$V_{CE(sat)*}$	Collector-Emitter Saturation Voltage	$I_C = 35\text{ A}$ $I_B = 3.5\text{ A}$		1.7	3	V
$V_{BE(sat)*}$	Base-Emitter Saturation Voltage	$I_C = 35\text{ A}$ $I_B = 3.5\text{ A}$		2.1	3.5	V
h_{FE*}	DC Current Gain	$I_C = 35\text{ A}$ $V_{CE} = 3\text{ V}$	10			
		$I_C = 35\text{ A}$ $V_{CE} = 5\text{ V}$	15	35		
t_s	INDUCTIVE LOAD Storage Time	$V_{CC} = 300\text{ V}$ $I_C = 35\text{ A}$		3.2	5	μs
		$I_{B1} = 3.5\text{ A}$ $V_{BE(off)} = -5\text{ V}$				
t_f	Fall Time	$T_J \leq 125\text{ }^{\circ}C$ (see test circuits)		0.9	1.5	μs
V_F	Diode Forward Voltage	$I_F = 35\text{ A}$		1.4	2	V
t_{rr}	Diode Reverse Recovery Time	$I_F = 35\text{ A}$ $di/dt = 100\text{ A}/\mu s$		0.3	0.6	μs

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

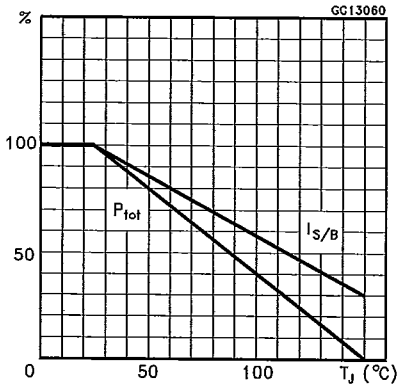
Safe Operating Areas



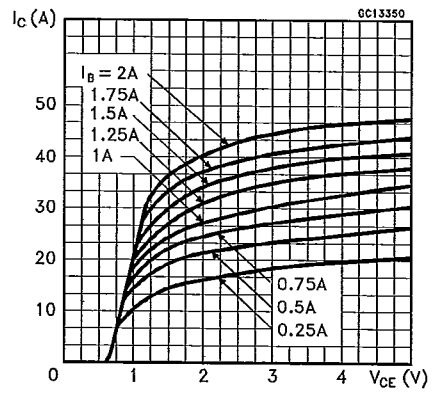
Thermal Impedance



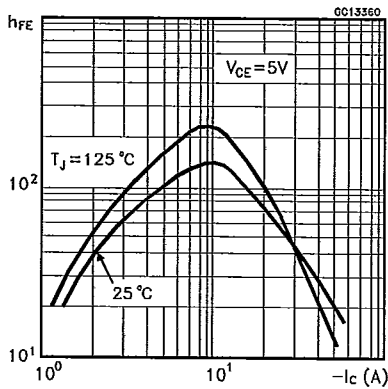
Derating Curves



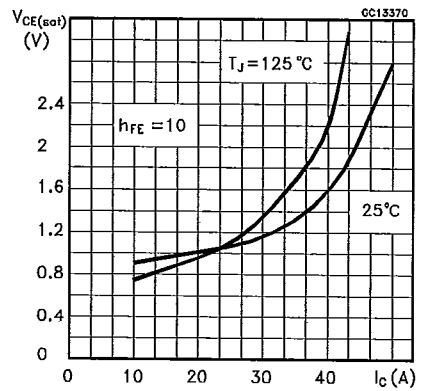
Output Characteristics



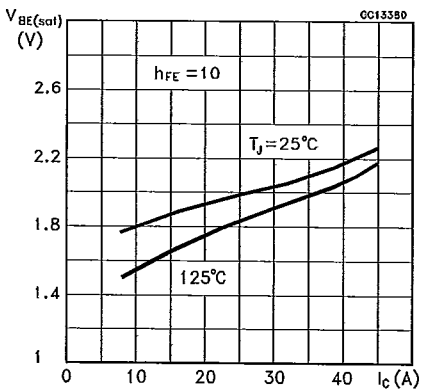
DC Current Gain



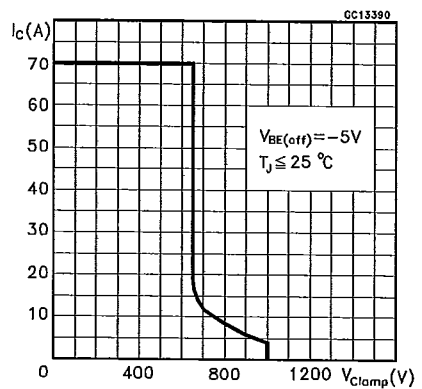
Collector-Emitter Saturation Voltage



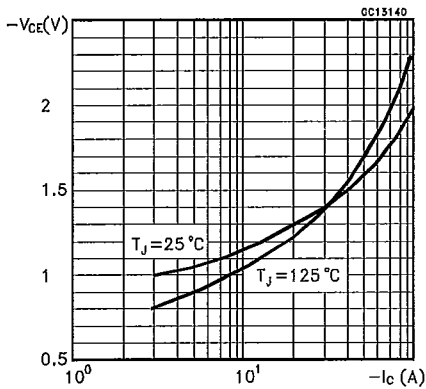
Base-Emitter Saturation Voltage



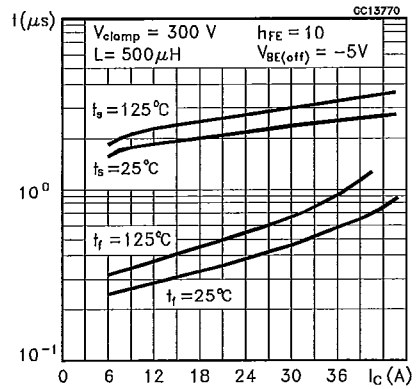
Reverse Biased SOA



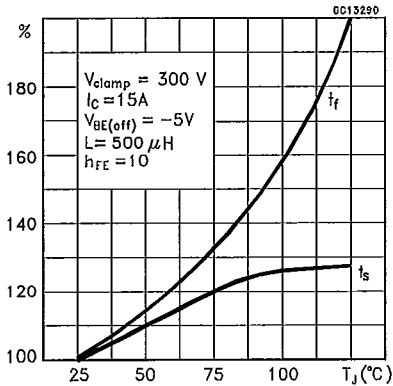
Typical V_F Versus I_F



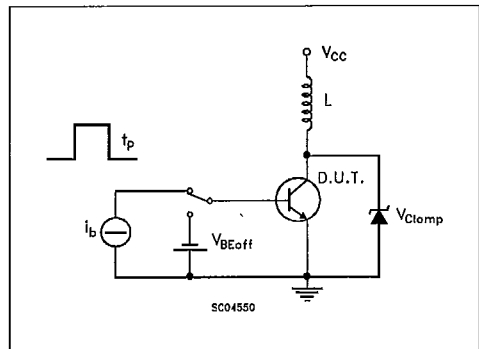
Switching Times Inductive Load



Switching Times Inductive Load Versus Temperature

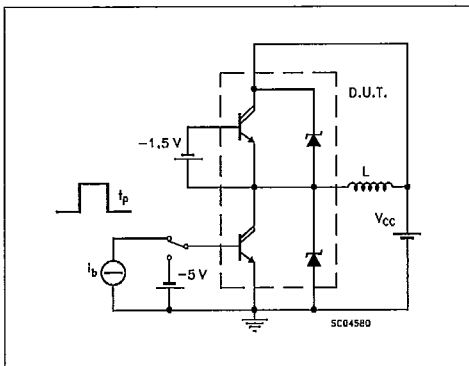


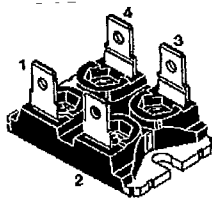
RBSOA Test Circuit



t_p adjusted for nominal I_C ; $I_C/I_B = 10$

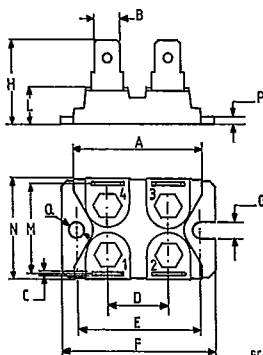
Switching Times Test Circuit





ISOTOP
Fast-on version
sales types with the suffix F

MECHANICAL DATA



FC-0309

	DIMENSIONS			
	mm		Inches	
	min.	max	min.	max
A	31.5	31.7	1.240	1.248
B	6.2	6.4	0.244	0.252
C	0.75	0.85	0.029	0.033
D	14.9	15.1	0.586	0.590
E	30.1	30.3	1.185	1.193
F	38	38.2	1.496	1.503
G	4	—	0.157	—
H	20.3	20.7	0.799	0.815
L	8.9	9.1	0.350	0.358
M	22.4	23	0.881	0.905
N	25.2	25.4	0.992	1.000
P	1.95	2.05	0.076	0.080
Q	4	—	0.157	—

PIN CONNECTIONS

MOSFET

pin 1: Source pin 2: Gate
pin 3: Drain pin 4: Source sensings

DARLINGTON

pin 1: Emitter pin 2: Base1
pin 3: Collector pin 4: Base 2

TRANSISTOR

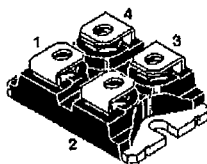
pin 1: Emitter pin 2: Base
pin 3: Collector pin 4: Emitter sensing

Torque: Mounting $1.3 \pm 0.2 \text{ N} \cdot \text{m}$ (max)

Weight: Package 25.5 g

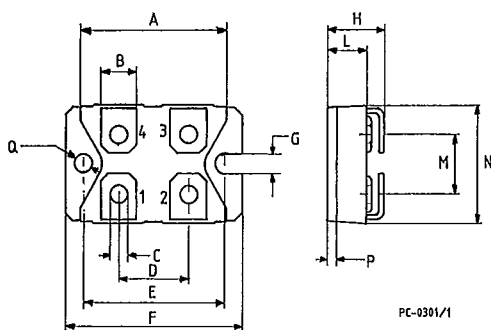
Note: The mechanical data are the same for the 3 pin version
(4th pin missing)

T-91-20



ISOTOP
Screw version
sales types with the suffix V

MECHANICAL DATA



PIN CONNECTIONS

MOSFET

pin 1: Source pin 2: Gate
pin 3: Drain pin 4: Source sensings

DARLINGTON

pin 1: Emitter pin 2: Base1
pin 3: Collector pin 4: Base 2

TRANSISTOR

pin 1: Emitter pin 2: Base
pin 3: Collector pin 4: Emitter sensing

Torque: Terminal $1.3 \pm 0.2 \text{ N} \cdot \text{m}$ (max)
Mounting $1.3 \pm 0.2 \text{ N} \cdot \text{m}$ (max)

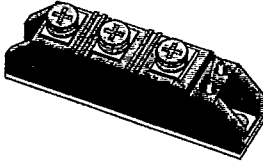
Weight: Package 29 g
4 Screws: 7.5 g

Note: The mechanical data are the same for the 3 pin version
(4th pin missing)

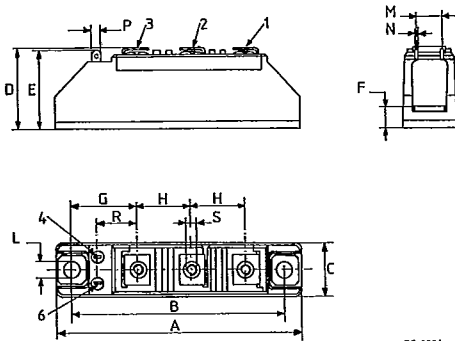
	DIMENSIONS			
	mm		Inches	
	min.	max	min.	max
A	31.5	31.7	1.240	1.248
B	7.8	8.2	0.307	0.322
C	4.1	4.3	0.161	0.169
D	14.9	15.1	0.586	0.590
E	30.1	30.3	1.185	1.193
F	38	38.2	1.496	1.503
G	4	—	0.157	—
H	11.8	12.2	0.464	0.480
L	8.9	9.1	0.350	0.358
M	12.6	12.8	0.496	0.503
N	25.2	25.4	0.992	1.000
P	1.95	2.05	0.076	0.080
Q	4	—	0.157	—

T-91-20

TRANSPACK (TO-240)



MECHANICAL DATA



PC-0296

	DIMENSIONS			
	mm		Inches	
	min.	max	min.	max
A	91.5	92.5	3.602	3.641
B	79.75	80.25	3.140	3.160
C	19.5	20.55	0.767	0.809
D	29.00	31.00	1.141	1.220
E	28.8	30	1.134	1.181
F	8.5 typ.		0.334 typ.	
G	24.4 typ.		0.960 typ.	
H	19.5	20.5	0.767	0.807
L	6.2 typ.		0.244 typ.	
M	8.95	11.05	0.352	0.435
N	0.78	0.84	0.030	0.033
P	2.72	2.87	0.107	0.113
R	14	—	0.551	—
S	M5			

Torque: Terminal $2.2 \pm 0.5 \text{ N} \cdot \text{m}$ (max)
Mounting $3.5 \pm 0.5 \text{ N} \cdot \text{m}$ (max)

Weight: Package 110 g
Accessory 21 g

Note: The mechanical data are the same for the 2 power pin version (either pin 1 or pin 2 missing)