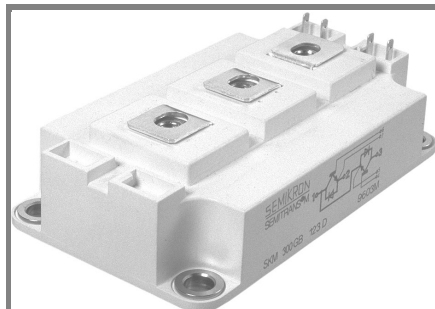


SKM 200GB125D



SEMITRANS™ 3

Ultra Fast IGBT Modules

SKM 200GB125D

SKM 200GAL125D

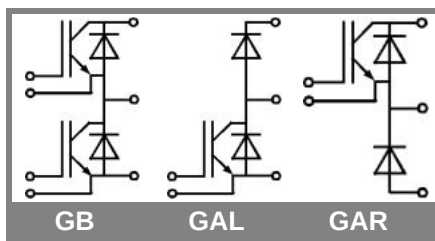
SKM 200GAR125D

Features

- N channel , homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (13 mm) and creepage distance (20 mm)

Typical Applications

- Switched mode power supplies at $f_{sw} > 20$ kHz
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at $f_{sw} > 20$ kHz



Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25$ (80) $^\circ\text{C}$	200 (160)	A
I_{CRM}	$t_p = 1$ ms	300	A
V_{GES}		± 20	V
T_{vj} (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000	V

Inverse diode			
I_F	$T_c = 25$ (80) $^\circ\text{C}$	200 (130)	A
I_{FRM}	$t_p = 1$ ms	300	A
I_{FSM}	$t_p = 10$ ms; sin.; $T_j = 150^\circ\text{C}$	1450	A

Freewheeling diode			
I_F	$T_c = 25$ (80) $^\circ\text{C}$	200 (130)	A
I_{FRM}	$t_p = 1$ ms	300	A
I_{FSM}	$t_p = 10$ ms; ; $T_j = 150^\circ\text{C}$	1450	A

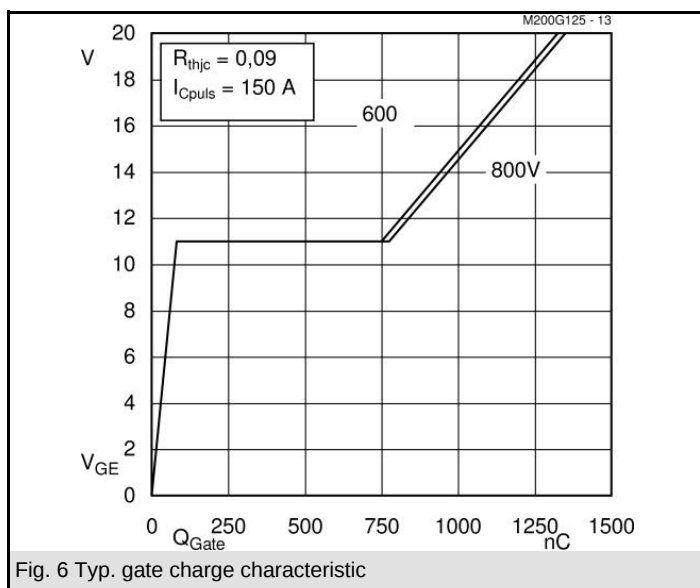
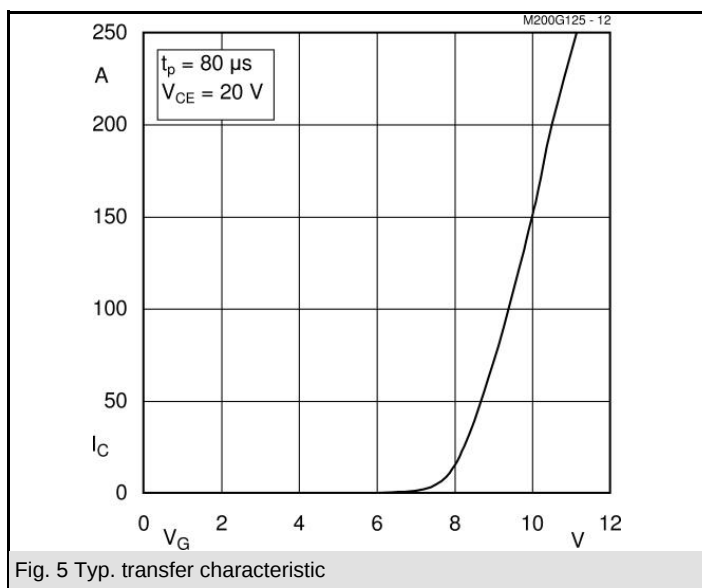
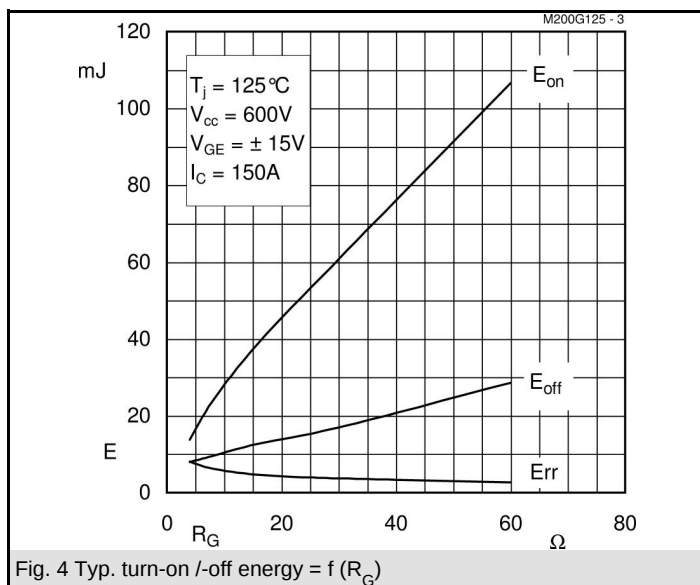
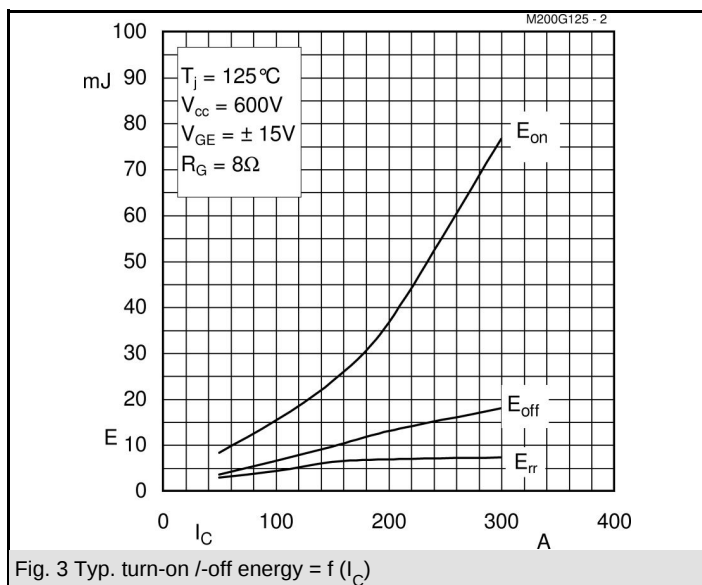
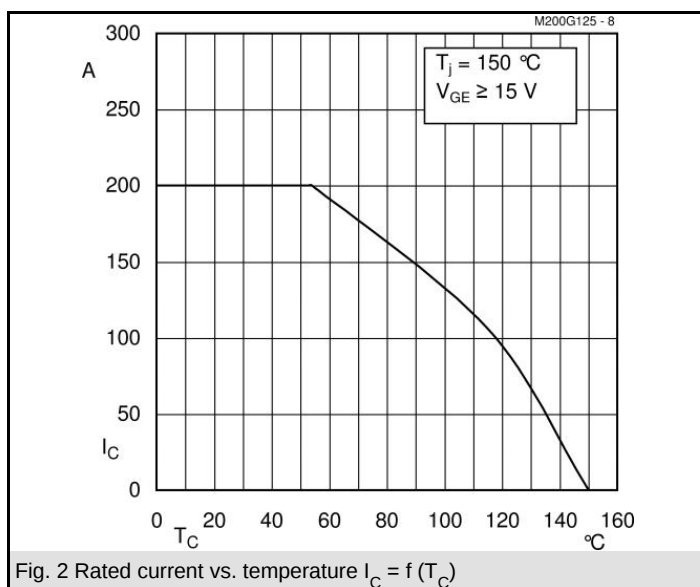
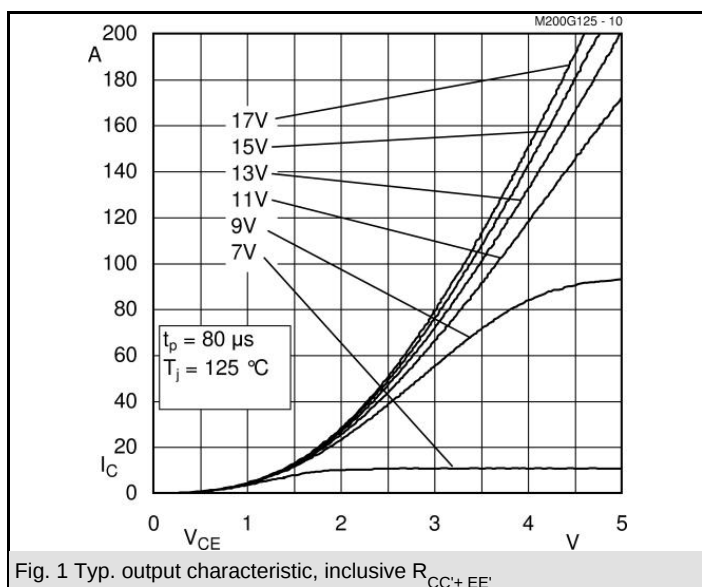
Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 6$ mA	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25$ (125) $^\circ\text{C}$		0,15	0,45	mA
$V_{CE(TO)}$	$T_j = 25$ (125) $^\circ\text{C}$		1,5	1,75	V
r_{CE}	$V_{GE} = 15$ V, $T_j = 25$ (125) $^\circ\text{C}$		12	14	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 150$ A, $V_{GE} = 15$ V, chip level		3,3	3,85	V
C_{ies}	under following conditions		10	13	nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25$ V, $f = 1$ MHz		1,5	2	nF
C_{res}			0,8	1,2	nF
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25$ (125) $^\circ\text{C}$		0,35 (0,5)		m Ω
$t_{d(on)}$	$V_{CC} = 600$ V, $I_{Cnom} = 150$ A		75		ns
t_r	$R_{Gon} = R_{Goff} = 4$ Ω , $T_j = 125^\circ\text{C}$		36		ns
$t_{d(off)}$	$V_{GE} = \pm 15$ V		420		ns
t_f			25		ns
E_{on} (E_{off})			14 (8)		mJ

Inverse diode			
$V_F = V_{EC}$	$I_{Fnom} = 150$ A; $V_{GE} = 0$ V; $T_j = 25$ (125) $^\circ\text{C}$	2 (1,8)	2,5
$V_{(TO)}$	$T_j = 25$ (125) $^\circ\text{C}$	1,1	1,2
r_T	$T_j = 25$ (125) $^\circ\text{C}$	6	8,7
I_{RRM}	$I_{Fnom} = 150$ A; $T_j = 125$ () $^\circ\text{C}$	230	A
Q_{rr}	$di/dt = 5500$ A/ μ s	24	μ C
E_{rr}	$V_{GE} = 0$ V	6,3	mJ

FWD			
$V_F = V_{EC}$	$I_F = 150$ A; $V_{GE} = 0$ V, $T_j = 25$ (125) $^\circ\text{C}$	2 (1,8)	2,5
$V_{(TO)}$	$T_j = 25$ (125) $^\circ\text{C}$	1,1	1,2
r_T	$T_j = 25$ (125) $^\circ\text{C}$	6	8,7
I_{RRM}	$I_F = 150$ A; $T_j = 125$ () $^\circ\text{C}$	230	A
Q_{rr}	$di/dt = 5500$ A/ μ s	24	μ C
E_{rr}	$V_{GE} = 0$ V	6,3	mJ

Thermal characteristics			
$R_{th(j-c)}$	per IGBT	0,09	K/W
$R_{th(j-c)D}$	per Inverse Diode	0,25	K/W
$R_{th(j-c)FD}$	per FWD	0,25	K/W
$R_{th(c-s)}$	per module	0,038	K/W

Mechanical data			
M_s	to heatsink M6	3	Nm
M_t	to terminals M6	2,5	Nm
w		325	g



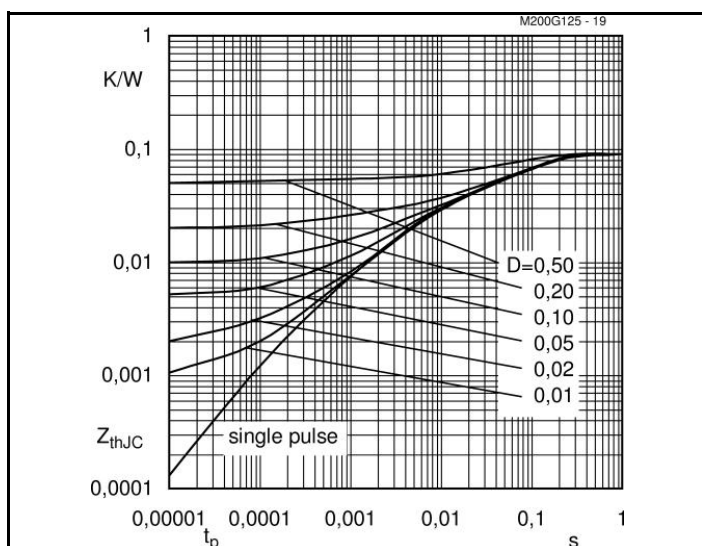
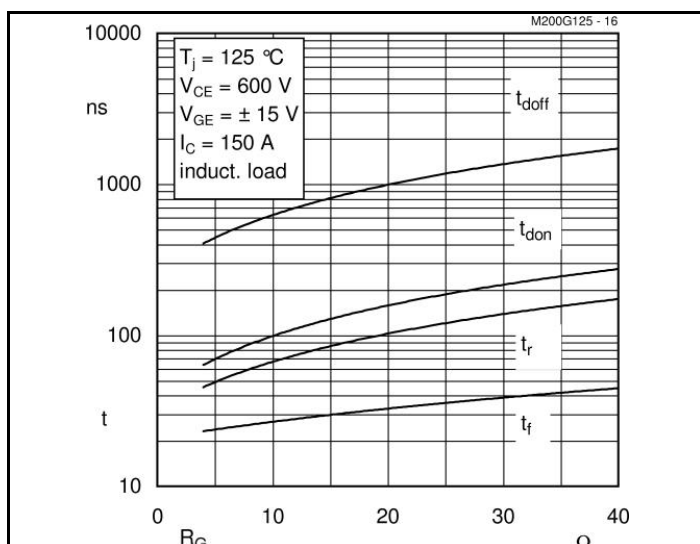
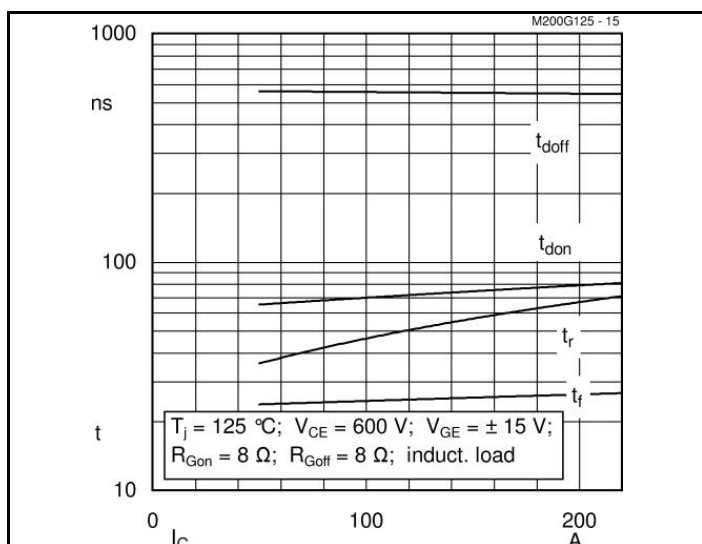


Fig. 9 Transient thermal impedance of IGBT

$$Z_{th(j-c)} = f(t_p); D = t_p/t_c = t_p \cdot f$$

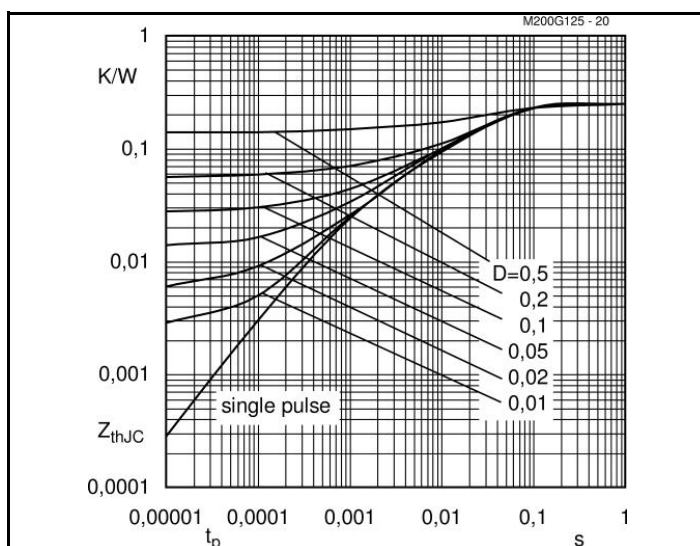


Fig. 10 Transient thermal impedance of FWD

$$Z_{th(j-c)} = f(t_p); D = t_p/t_c = t_p \cdot f$$

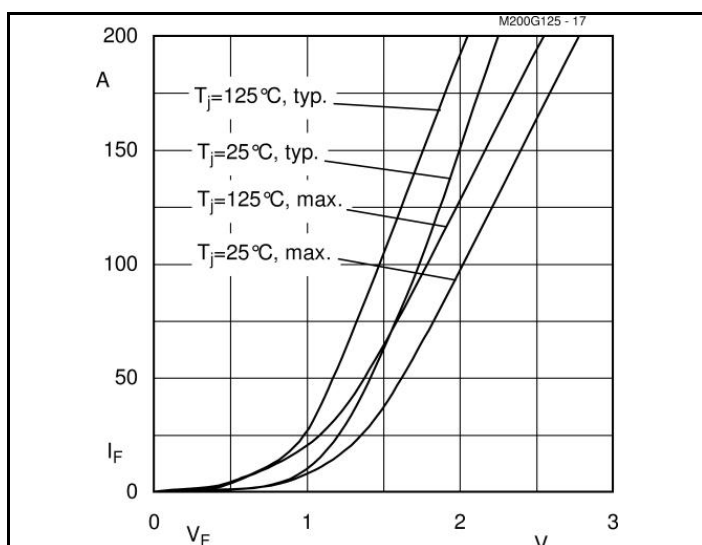


Fig. 11 CAL diode forward characteristic

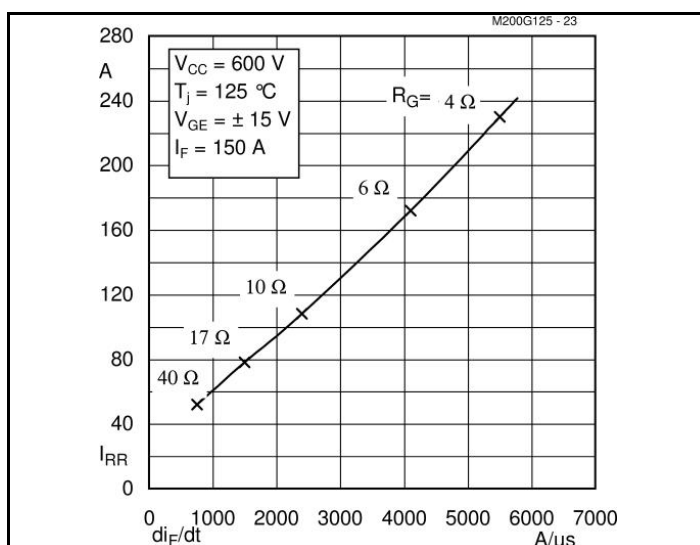
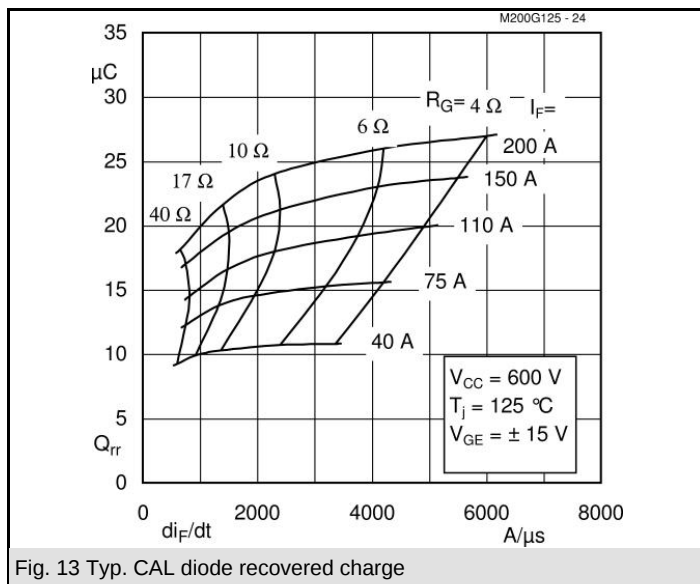


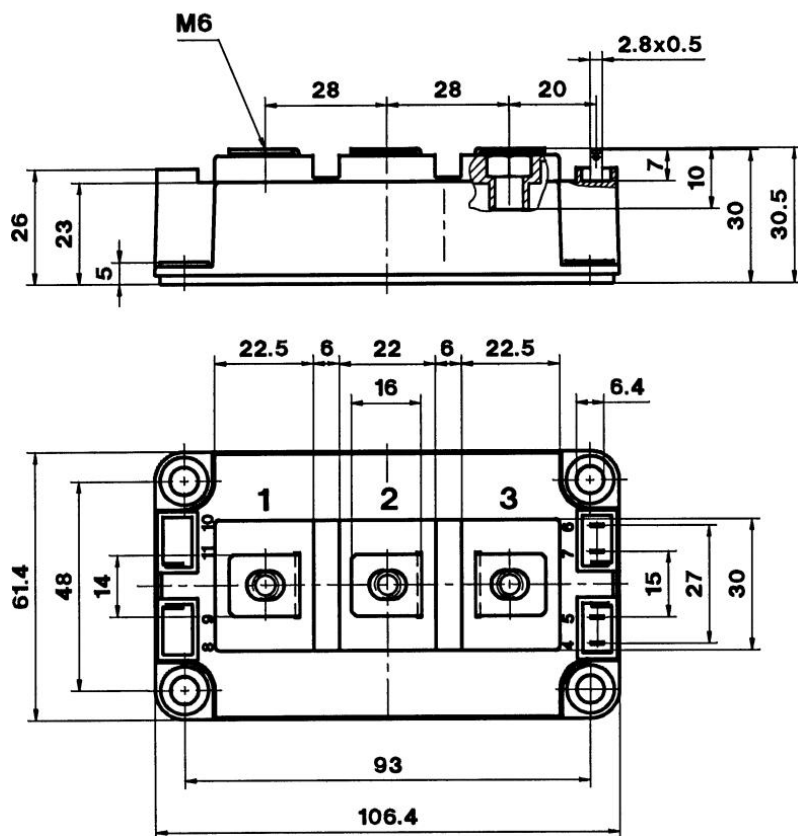
Fig. 12 Typ. CAL diode peak reverse recovery current



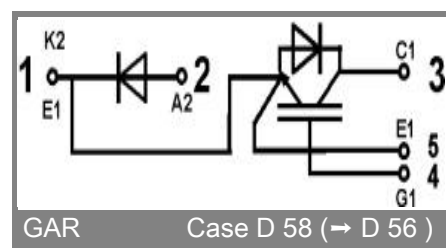
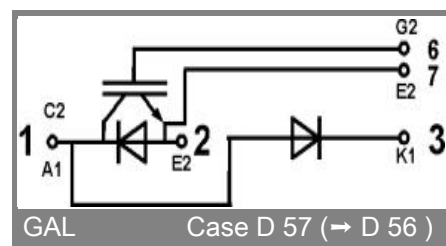
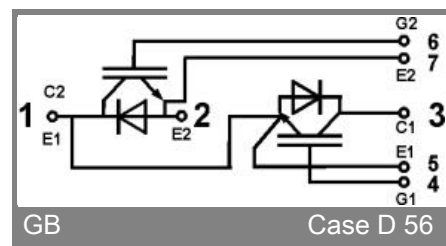
UL Recognized
File no. E 63 532

Dimensions in mm

CASED56



Case D 56



This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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