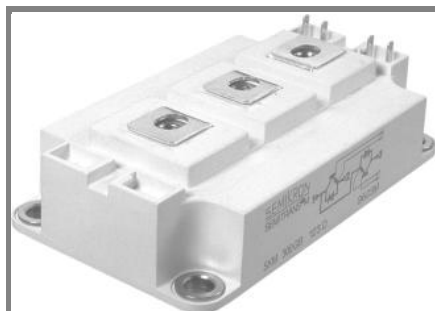




SEMITRANS™ 3

Trench IGBT Modules

SKM 400GB066D

Preliminary Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

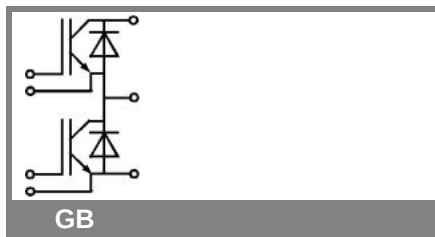
- AC inverter drives
- UPS
- Electronic welders

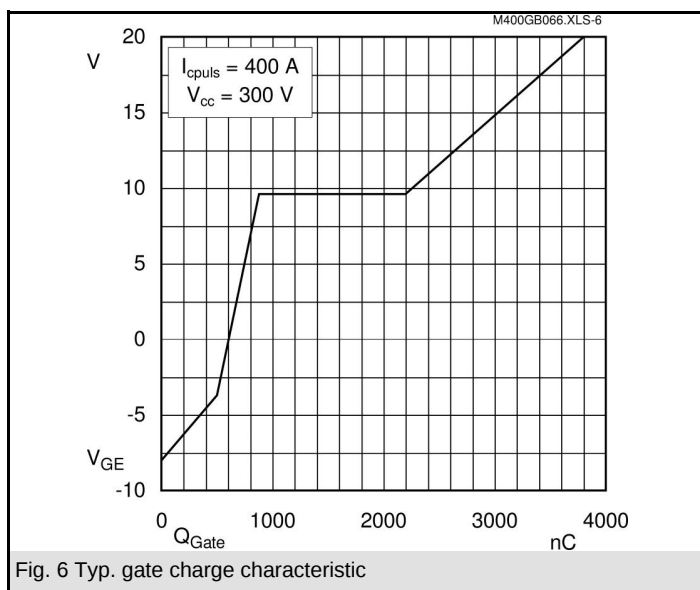
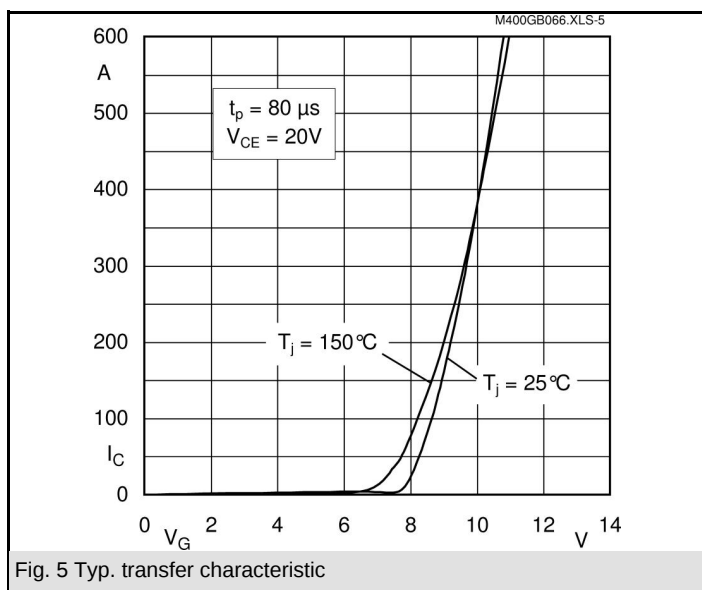
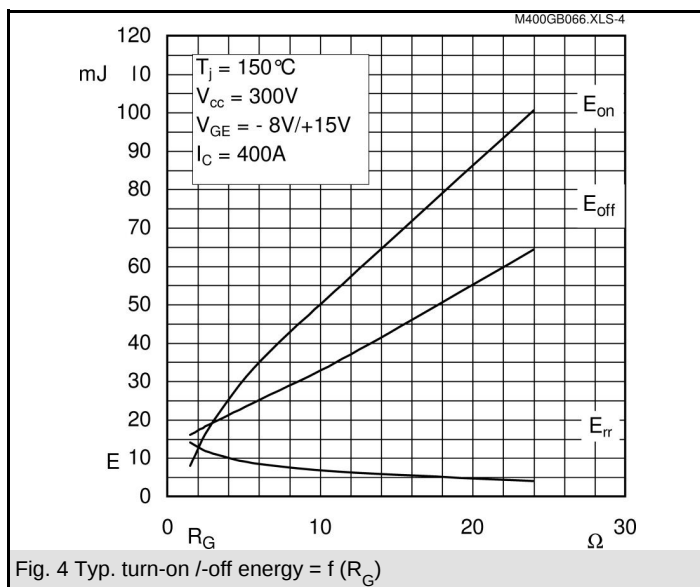
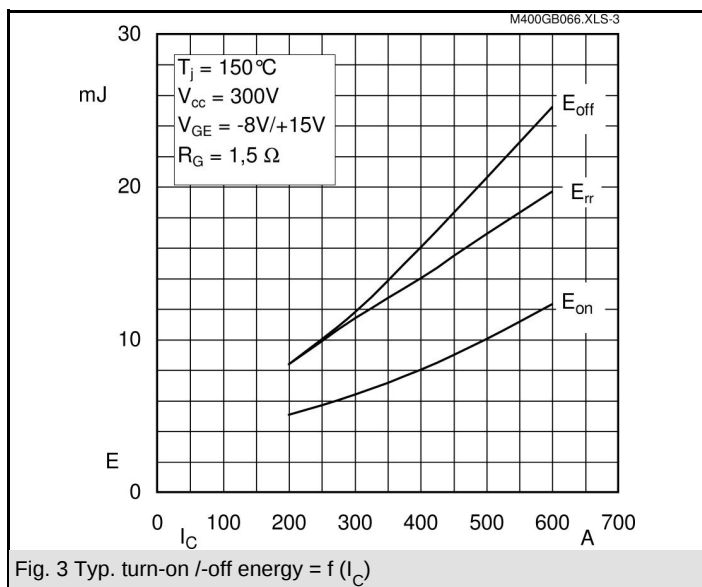
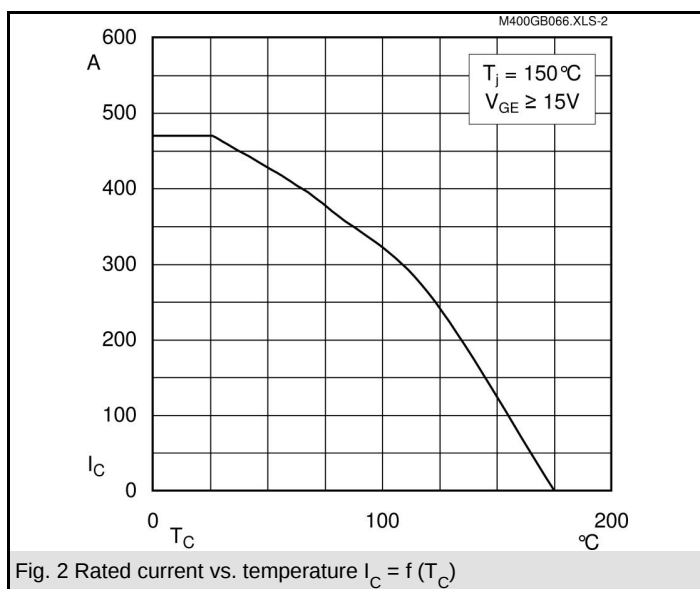
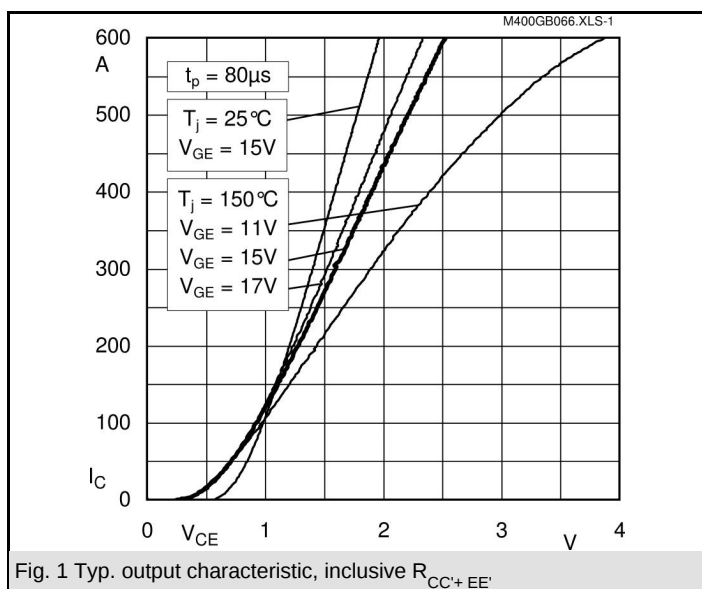
Remarks

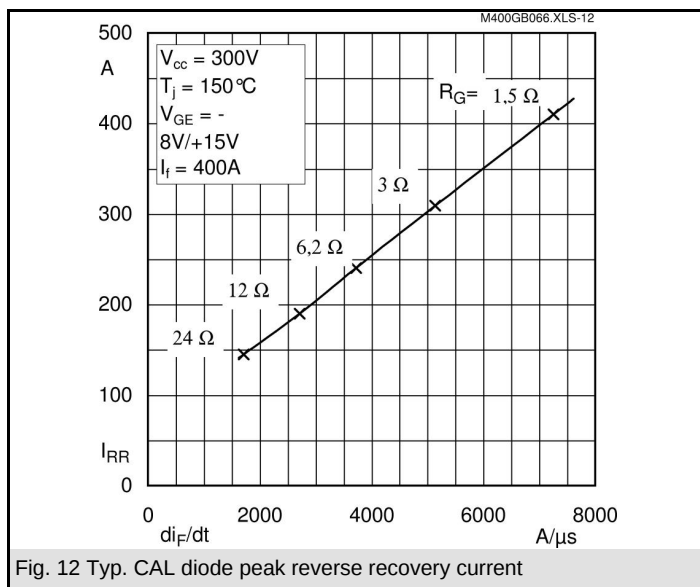
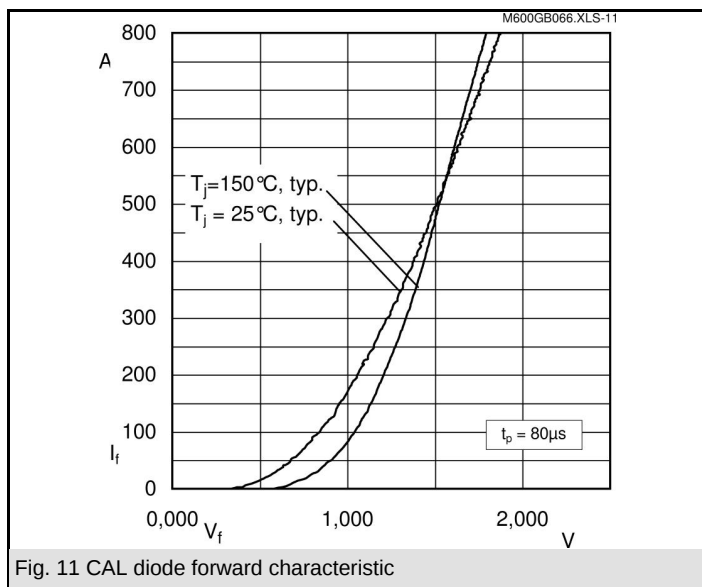
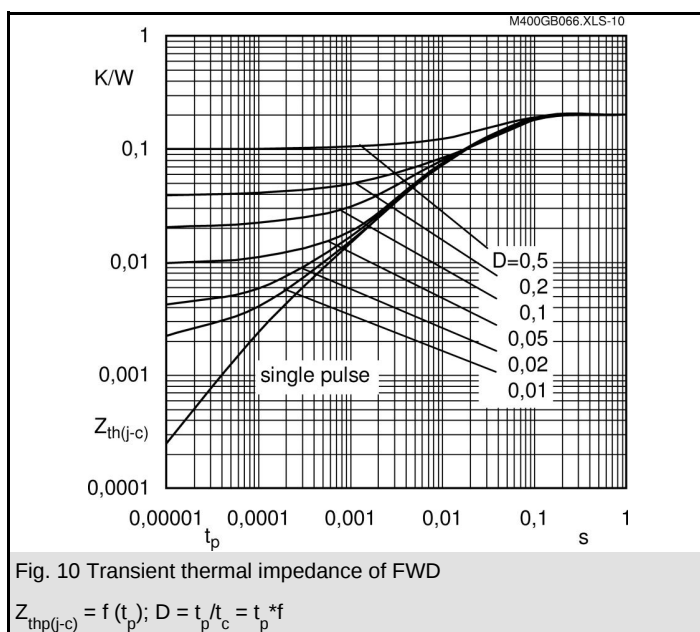
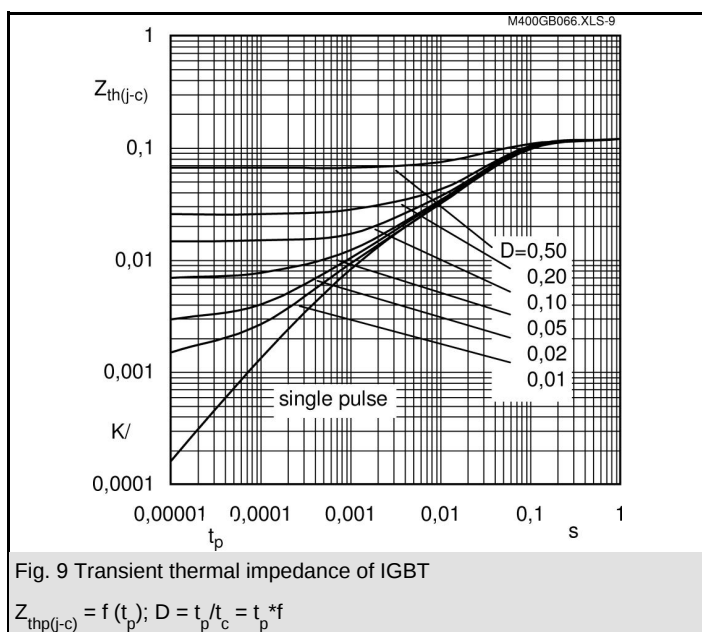
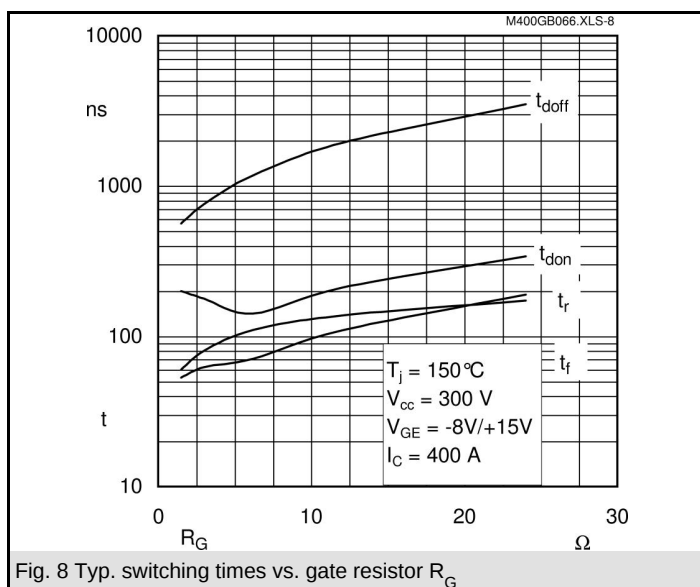
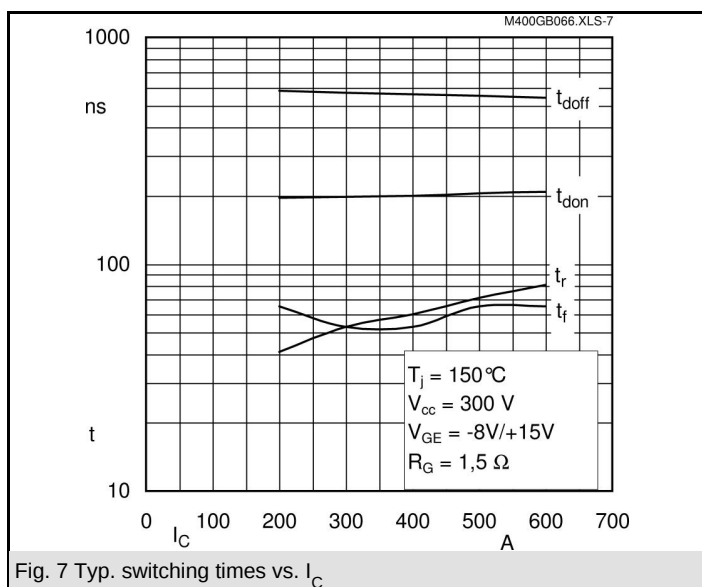
- Case temperature limited to $T_C = 125^\circ\text{C}$ max, recommended $T_{op} = -40 \dots +150^\circ\text{C}$
- Product reliability results are valid for $T_j \leq 150^\circ\text{C}$
- Short circuit data: $t_p \leq 6\mu\text{s}$; $V_{GE} \leq 15\text{V}$; $T_j = 150^\circ\text{C}$; $V_{CC} \leq 360\text{V}$, use of soft R_G necessary !
- Take care of over-voltage caused by stray inductances

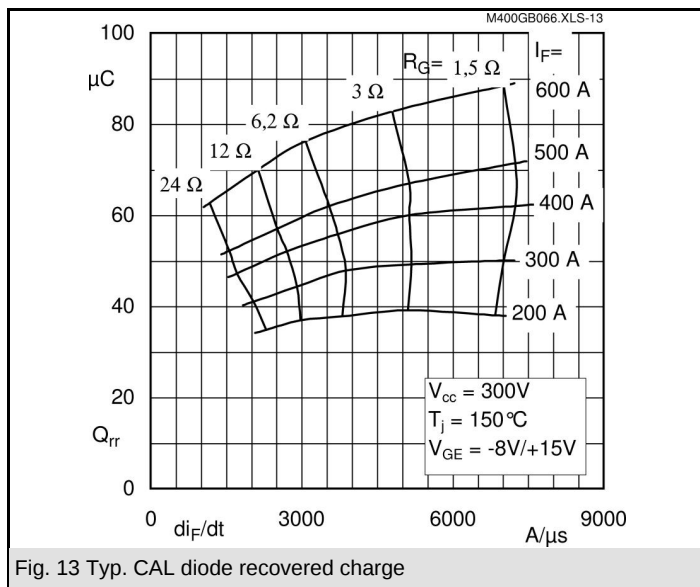
Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		600	V
I_C	$T_C = 25 (80)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	460 (330)	A
I_C	$T_C = 25 (80)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	470 (370)	A
I_{CRM}	$t_p = 1 \text{ ms}$	600	A
V_{GES}		± 20	V
T_{vj} , (T_{stg})		$-40 \dots +175 (125)$	$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
I_F	$T_C = 25 (80)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	430 (320)	A
I_F	$T_C = 25 (80)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	430 (320)	A
I_{FRM}	$t_p = 1 \text{ ms}$	800	A
I_{FSM}	$t_p = 10 \text{ ms}$; sin.; $T_j = 175^\circ\text{C}$		A

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 6,4 \text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25 ()^\circ\text{C}$		0,25	0,75	mA
$V_{CE(TO)}$	$T_j = 25 ()^\circ\text{C}$		0,9 (0,85)	1 (0,9)	V
r_{CE}	$V_{GE} = 15 \text{ V}$, $T_j = 25 (150)^\circ\text{C}$		1,4 (2,1)	2,3 (3)	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 400 \text{ A}$, $V_{GE} = 15 \text{ V}$, chip level		1,45 (1,7)	1,9 (2,1)	V
C_{ies}	under following conditions		24,7		nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25 \text{ V}$, $f = 1 \text{ MHz}$		1,54		nF
C_{res}			0,73		nF
L_{CE}				20	nH
$R_{CC+EE'}$	res., terminal-chip $T_C = 25 (125)^\circ\text{C}$		0,35 (0,5)		$\text{m}\Omega$
$t_{d(on)}$	$V_{CC} = 300 \text{ V}$, $I_{Cnom} = 400 \text{ A}$		200		ns
t_r	$R_{Gon} = R_{Goff} = 1,5 \Omega$, $T_j = 150^\circ\text{C}$		60		ns
$t_{d(off)}$	$V_{GE} = -8\text{V} / +15\text{V}$		560		ns
t_f			53		ns
$E_{on} (E_{off})$			8 (16)		mJ
Inverse diode					
$V_F = V_{EC}$	$I_{Fnom} = 400 \text{ A}$; $V_{GE} = 0 \text{ V}$; $T_j = 25 (150)^\circ\text{C}$		1,4	1,6	V
$V_{(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,95	1	V
r_T	$T_j = 25 (150)^\circ\text{C}$		1,1	1,5	$\text{m}\Omega$
I_{RRM}	$I_{Fnom} = 400 \text{ A}$; $T_j = 150 ()^\circ\text{C}$		410		A
Q_{rr}	$di/dt = 7250 \text{ A}/\mu\text{s}$		62		μC
E_{rr}	$V_{GE} = 0 \text{ V}$		14		mJ
Thermal characteristics					
$R_{th(j-c)}$	per IGBT			0,12	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,2	K/W
$R_{th(c-s)}$	per module			0,038	K/W
Mechanical data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M6	2,5		5	Nm
w				325	g





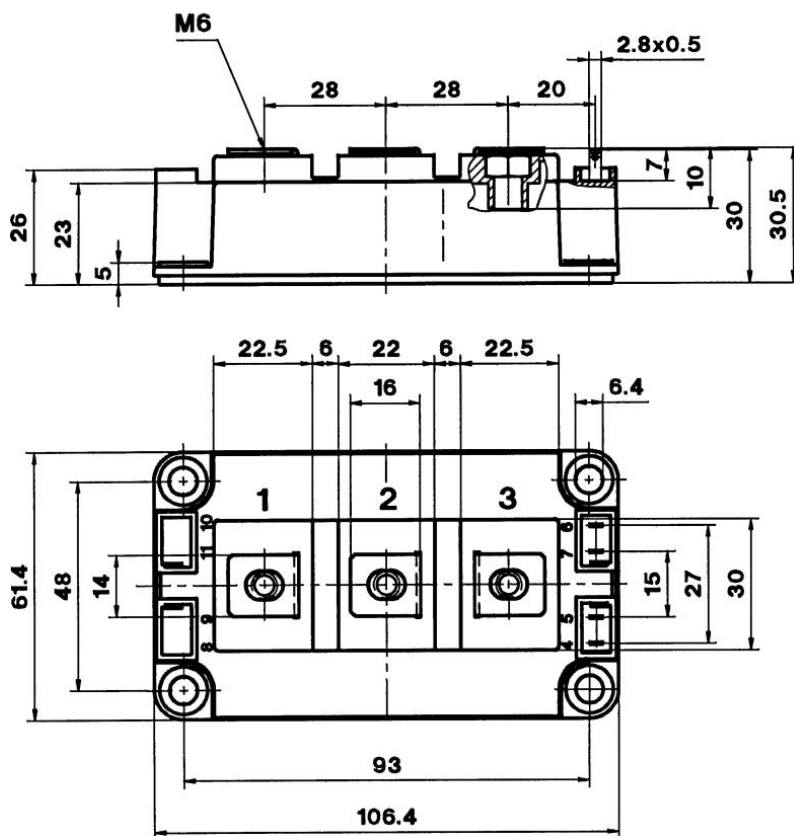




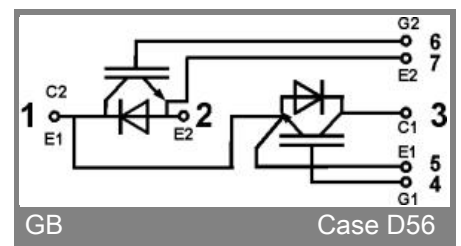
UL Recognized
File no. E 63 532

Dimensions in mm

CASED56



Case D 56



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

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.