

SKM 500GA128D



SEMITRANS™ 4

SPT IGBT Modules

SKM 500GA128D

Preliminary Data

Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

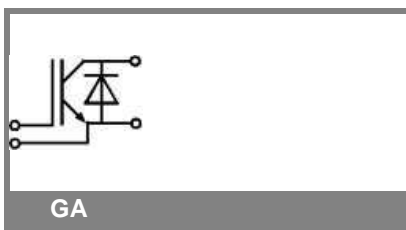
- AC inverter drives
- UPS
- Electronic welders at f_{sw} up to 20 kHz

Remarks

- $I_{DC} \leq 500$ A for $T_{Terminal} = 100$ °C

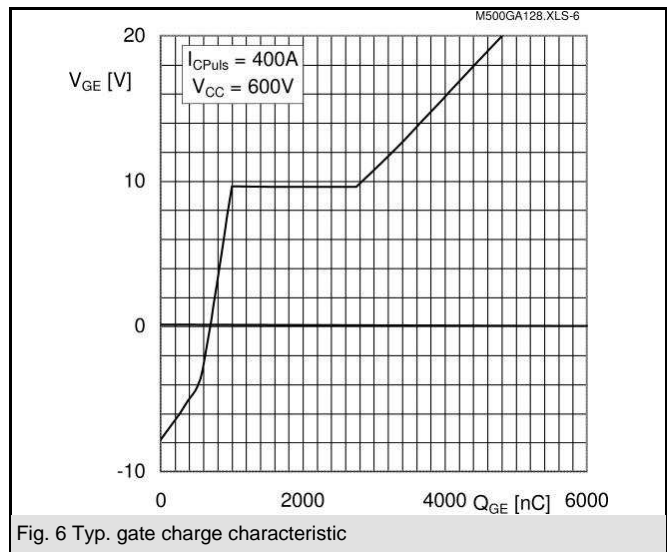
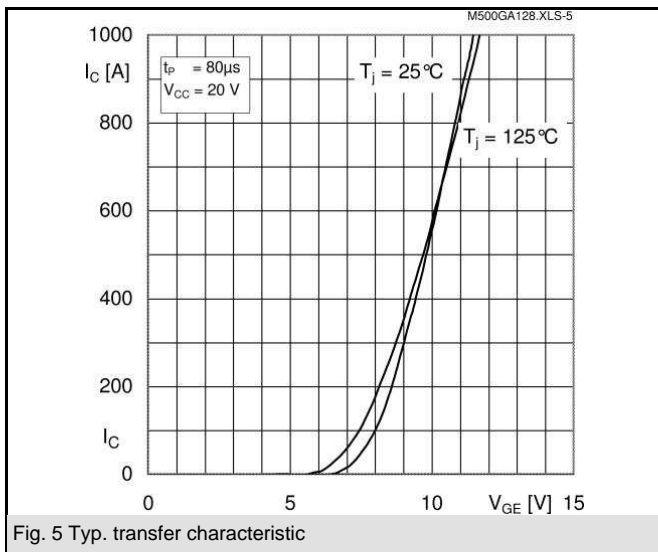
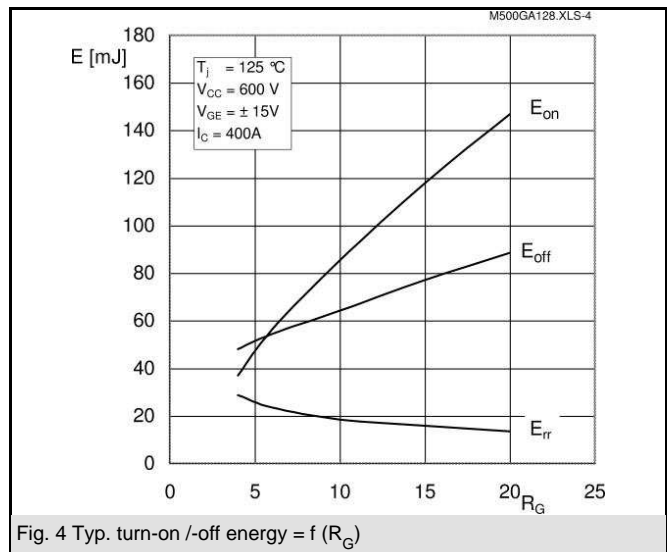
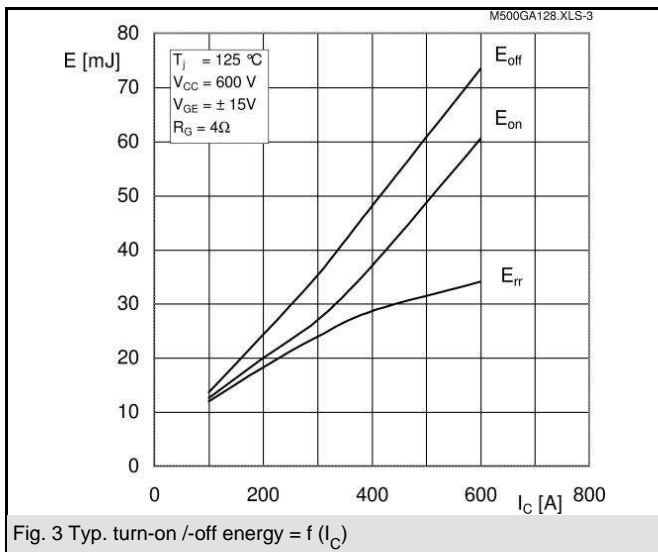
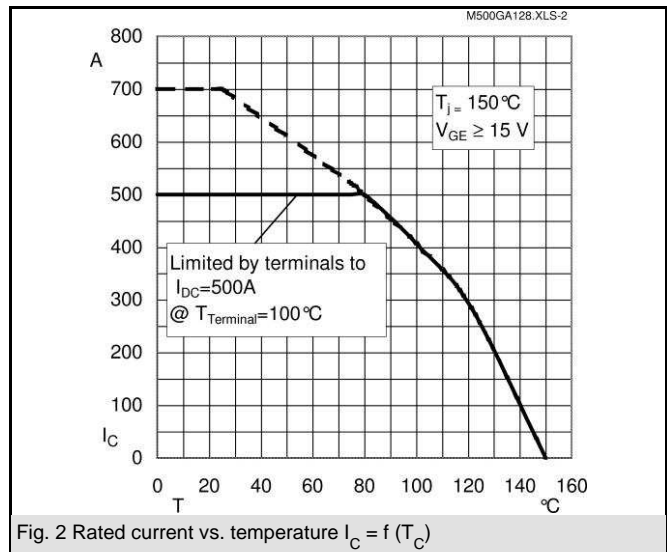
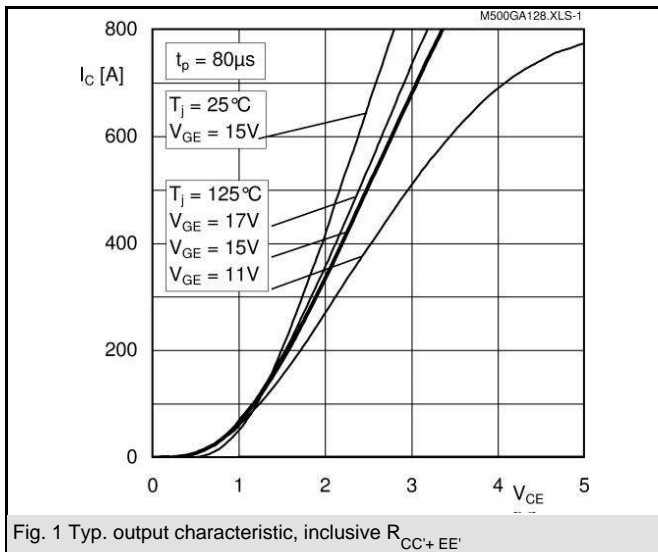
Absolute Maximum Ratings		$T_c = 25$ °C, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25$ (80) °C	700 (500)	A
I_{CRM}	$T_c = 25$ (80) °C, $t_p = 1$ ms	1400 (1000)	A
V_{GES}		± 20	V
T_{vj} , (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	°C
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
$I_F = -I_C$	$T_c = 25$ (80) °C	530 (350)	A
I_{FRM}	$T_c = 25$ (80) °C, $t_p = 1$ ms	1400 (1000)	A
I_{FSM}	$t_p = 10$ ms; sin.; $T_j = 150$ °C	3600	A

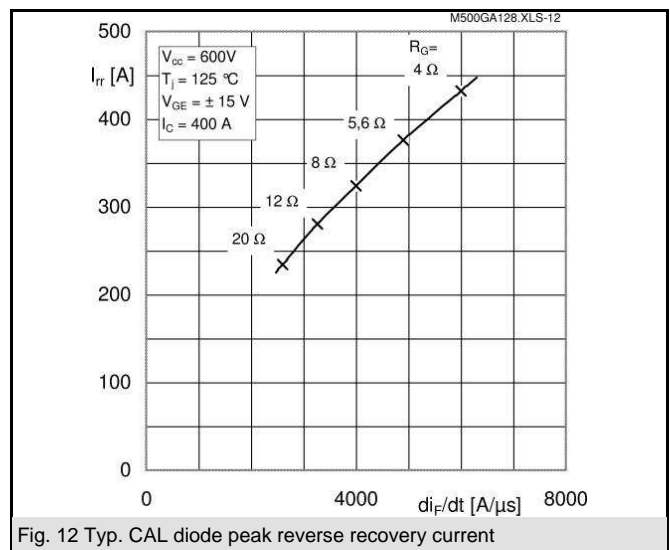
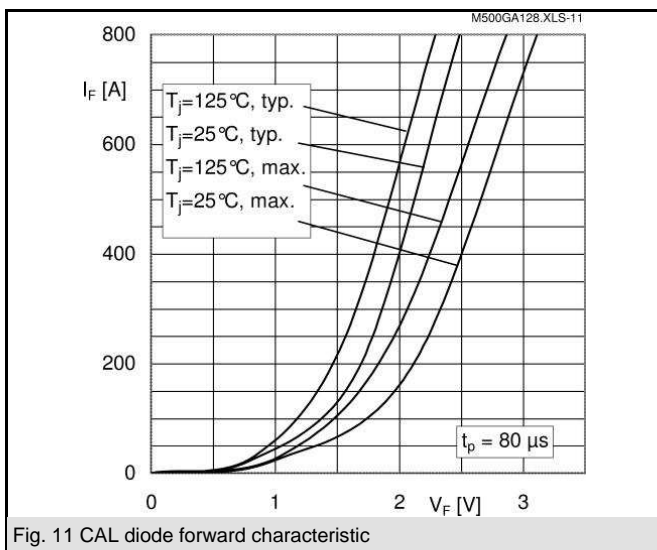
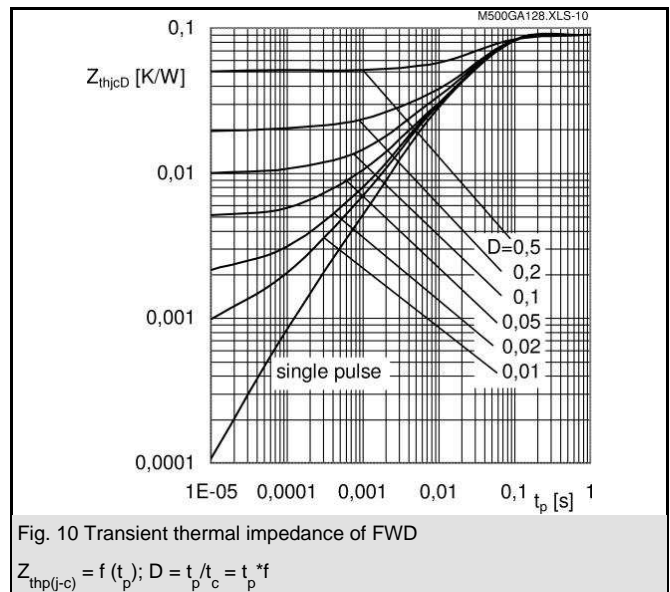
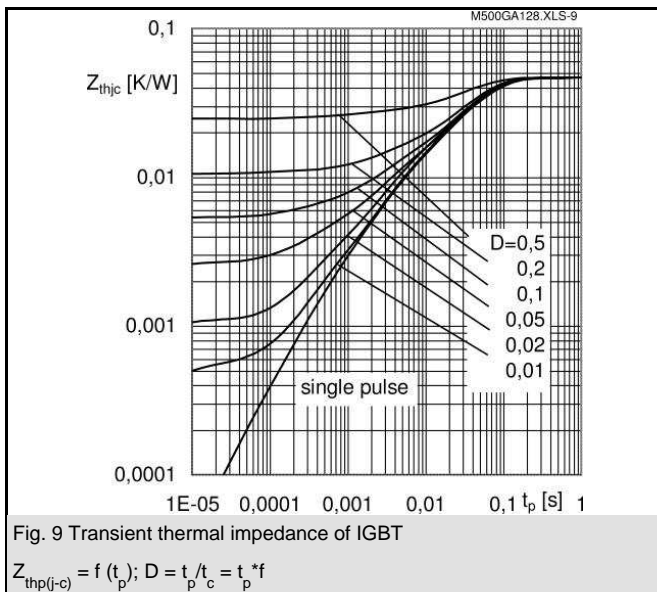
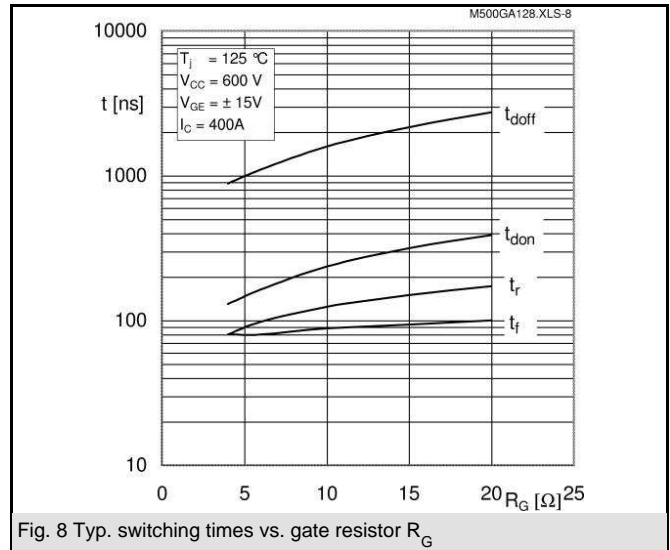
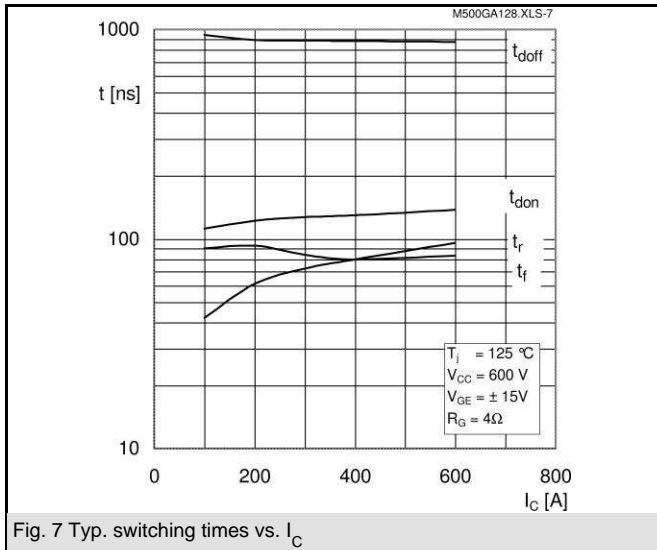
Characteristics		$T_c = 25$ °C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 16$ mA	4,5	5,5	6,5	V
I_{CES}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25$ () °C		0,2	0,6	mA
$V_{CE(TO)}$	$T_j = 25$ () °C		1 (0,9)	1,15 (1,05)	V
r_{CE}	$V_{GE} = 15$ V, $T_j = 25$ (125) °C		2,3 (3)	3 (3,8)	mΩ
$V_{CE(sat)}$	$I_C = 400$ A, $V_{GE} = 15$ V, chip level		1,9 (2,1)	2,35 (2,55)	V
C_{ies}	under following conditions		35		nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25$ V, $f = 1$ MHz		4		nF
C_{res}			4		nF
L_{CE}				20	nH
$R_{CC+EE'}$	res., terminal-chip $T_c = 25$ (125) °C		0,18 (0,22)		mΩ
$t_{d(on)}$	$V_{CC} = 600$ V, $I_C = 400$ A		130		ns
t_r	$R_{Gon} = R_{Goff} = 4$ Ω, $T_j = 125$ °C		80		ns
$t_{d(off)}$	$V_{GE} = \pm 15$ V		880		ns
t_f			80		ns
E_{on} (E_{off})			37 (48)		mJ
Inverse diode					
$V_F = V_{EC}$	$I_F = 400$ A; $V_{GE} = 0$ V; $T_j = 25$ (125) °C		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25$ (125) °C		1,1	1,2	V
r_T	$T_j = 25$ (125) °C		2,3	3,3	mΩ
I_{RRM}	$I_F = 400$ A; $T_j = 125$ () °C		430		A
Q_{rr}	$di/dt = 6000$ A/μs		67		μC
E_{rr}	$V_{GE} = 0$ V		29		mJ
Thermal characteristics					
$R_{th(j-c)}$	per IGBT			0,047	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,09	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, M4	2,5		5	Nm
w				330	g



GA

SKM 500GA128D





SKM 500GA128D

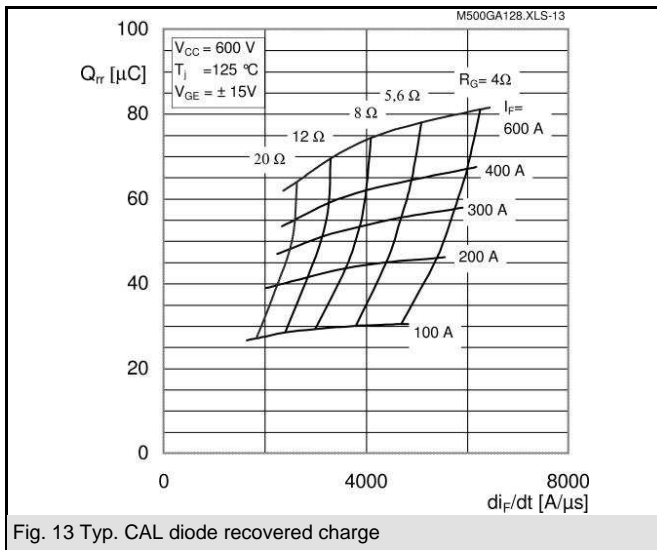
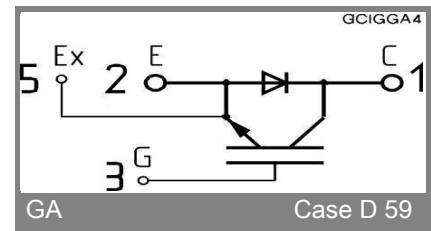
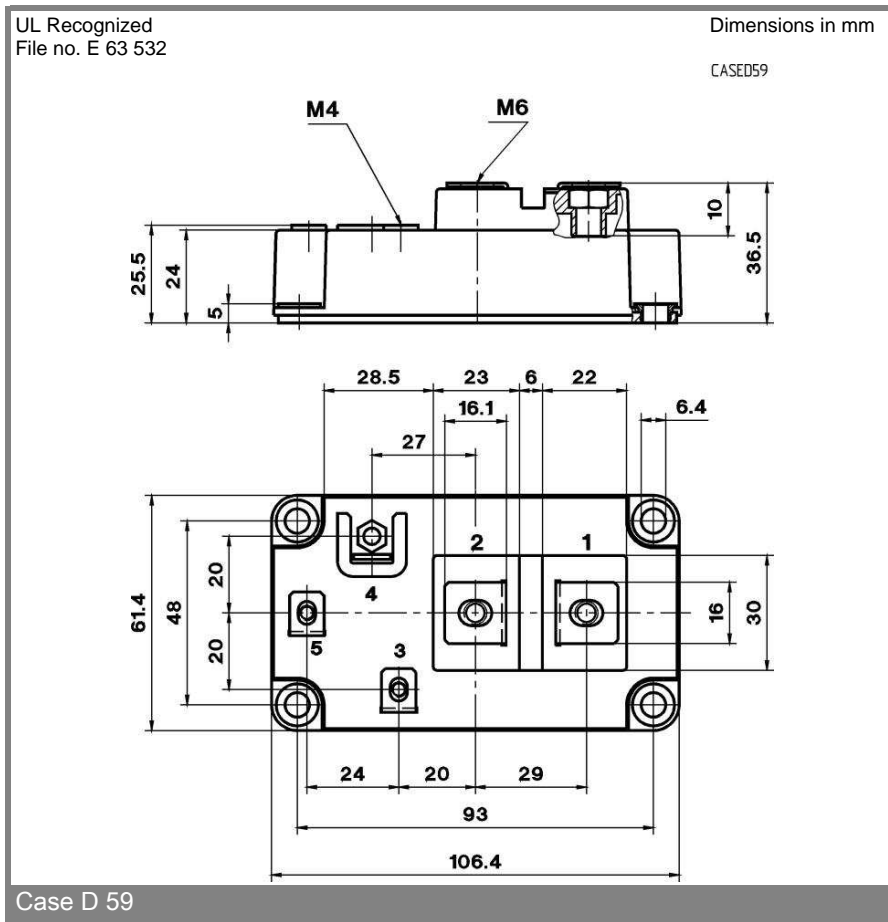


Fig. 13 Typ. CAL diode recovered charge



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.