

SKM 400GA128D



SEMITRANS[®] 4

SPT IGBT Modules

SKM 400GA128D

Features

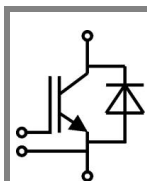
- SPT = Soft-Punch-Through technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

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



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200		V
I_C	$T_j = 150^\circ\text{C}$	$T_c = 25^\circ\text{C}$	565	A
		$T_c = 80^\circ\text{C}$	400	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$	600		A
V_{GES}		± 20		V
t_{psc}	$V_{CC} = 600$ V; $V_{GE} \leq 20$ V; $T_j = 125^\circ\text{C}$ $V_{CES} < 1200$ V	10		μs
Inverse Diode				
I_F	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	390	A
		$T_{case} = 80^\circ\text{C}$	260	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$	600		A
I_{FSM}	$t_p = 10$ ms; sin.	$T_j = 150^\circ\text{C}$	2900	A
Module				
$I_{t(RMS)}$		500		A
T_{vj}		- 40... + 150		$^\circ\text{C}$
T_{stg}		- 40... + 125		$^\circ\text{C}$
V_{isol}	AC, 1 min.	4000		V

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 12$ mA	4,5	5,5	6,45	V
I_{CES}	$V_{GE} = 0$ V, $V_{CE} = V_{CES}$		0,2	0,6	mA
V_{CE0}		$T_j = 25^\circ\text{C}$	1	1,15	V
		$T_j = 125^\circ\text{C}$	0,9	1,05	V
r_{CE}	$V_{GE} = 15$ V	$T_j = 25^\circ\text{C}$	3	4	m Ω
		$T_j = 125^\circ\text{C}$	4	5	m Ω
$V_{CE(sat)}$	$I_{Cnom} = 300$ A, $V_{GE} = 15$ V	$T_j = 25^\circ\text{C}_{chiplev.}$	1,9	2,35	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,1	2,55	V
C_{ies}	$V_{CE} = 25$, $V_{GE} = 0$ V	$f = 1$ MHz	26		nF
C_{oes}			3		nF
C_{res}			3		nF
Q_G	$V_{GE} = -8$ V - +20V	3500		nC	
R_{Gint}	$T_j = ^\circ\text{C}$	1,25		Ω	
$t_{d(on)}$	$R_{Gon} = 5$ Ω	$V_{CC} = 600$ V $I_{Cnom} = 300$ A	120		ns
t_r			70		ns
E_{on}			31		mJ
$t_{d(off)}$	$R_{Goff} = 5$ Ω	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15$ V	800		ns
t_f			75		ns
E_{off}			33		mJ
$R_{th(j-c)}$	per IGBT	0,055		K/W	



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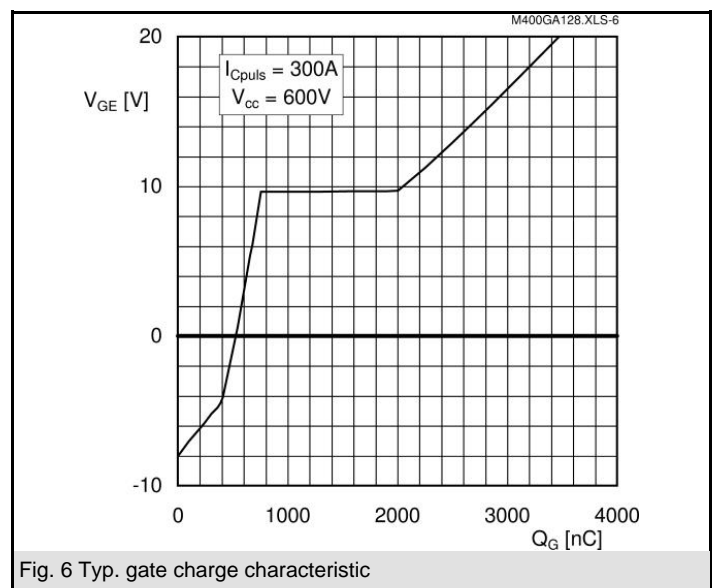
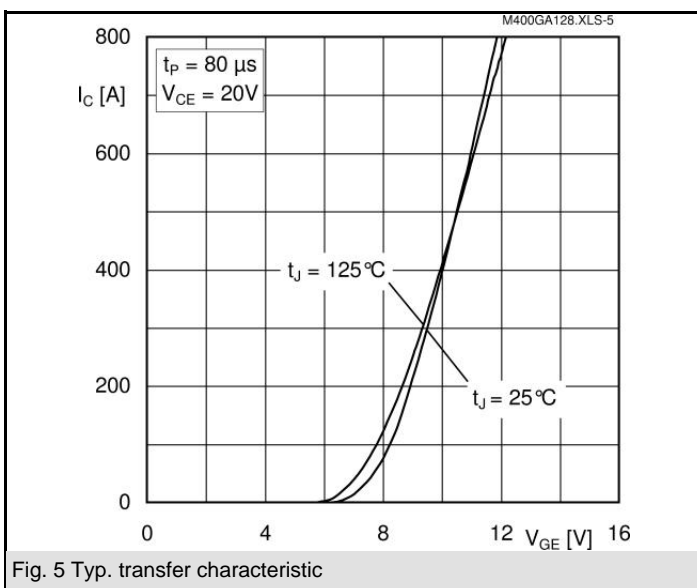
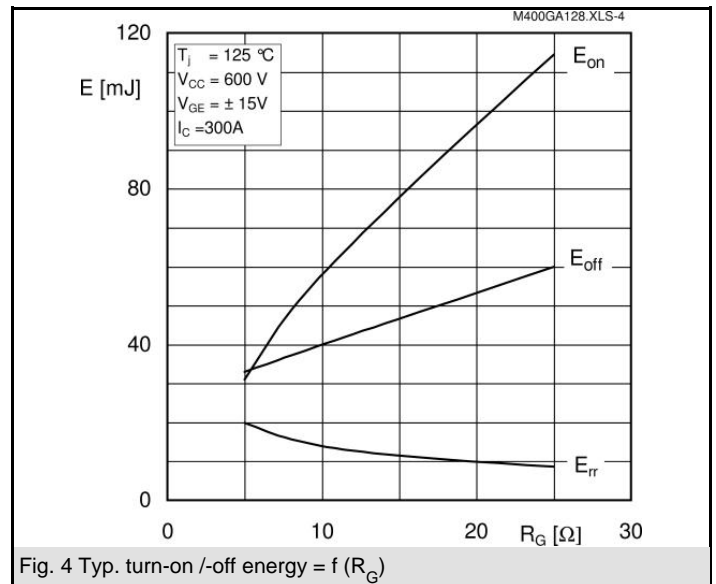
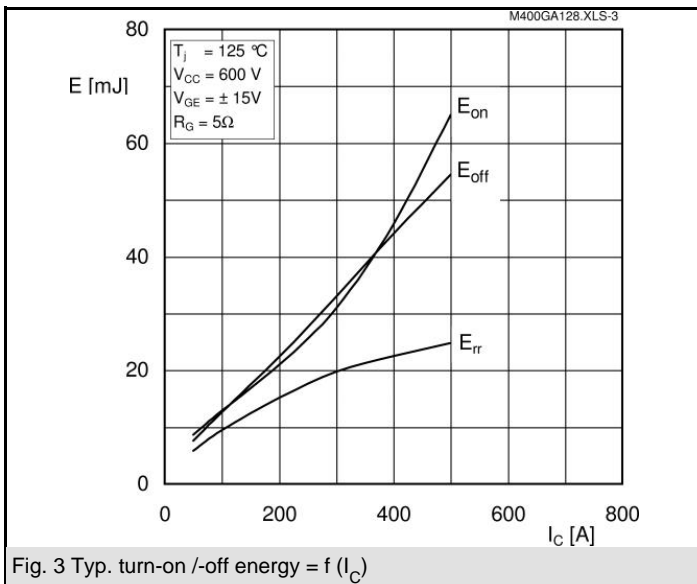
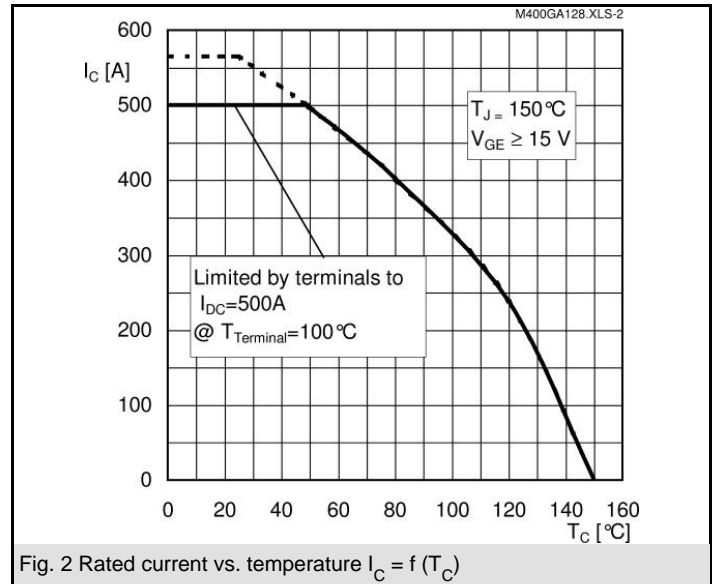
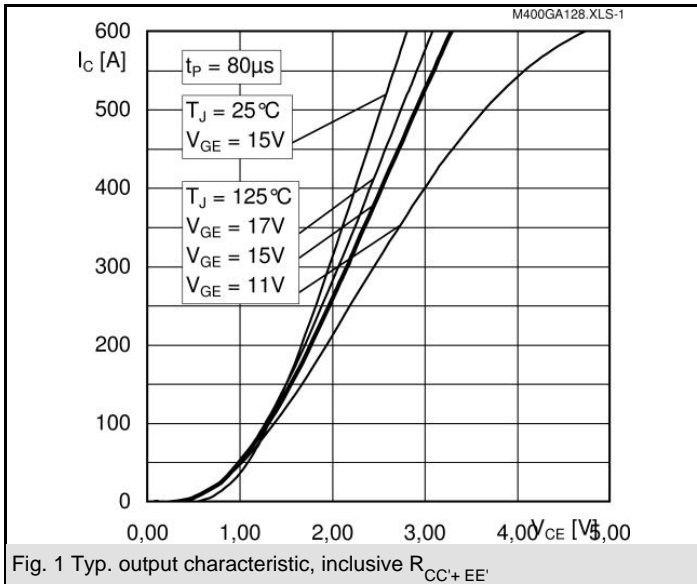


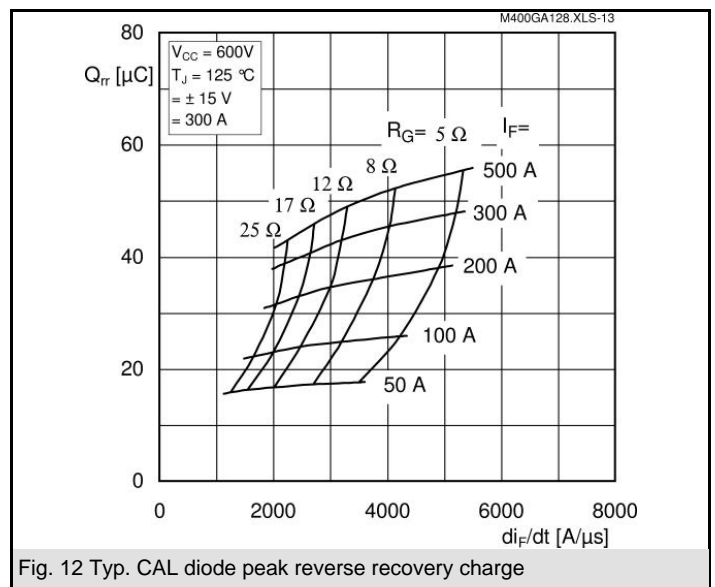
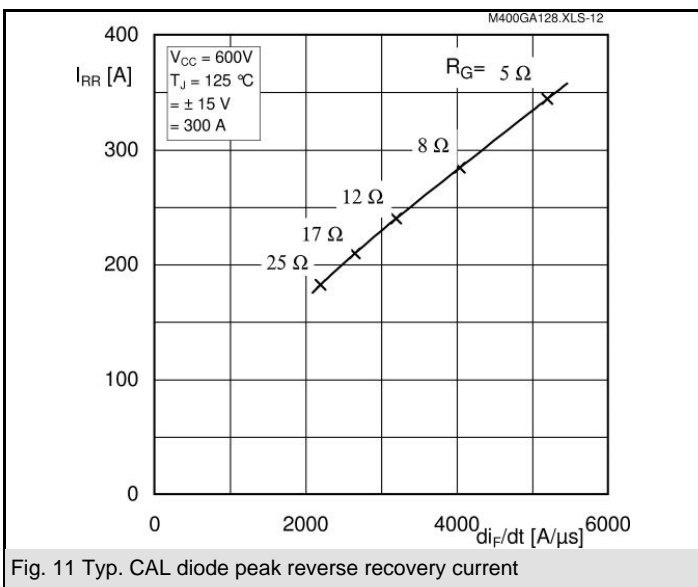
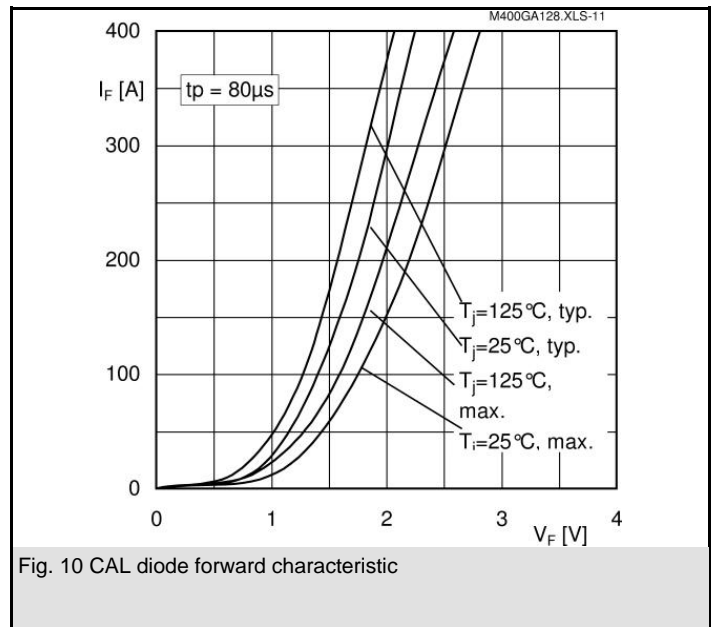
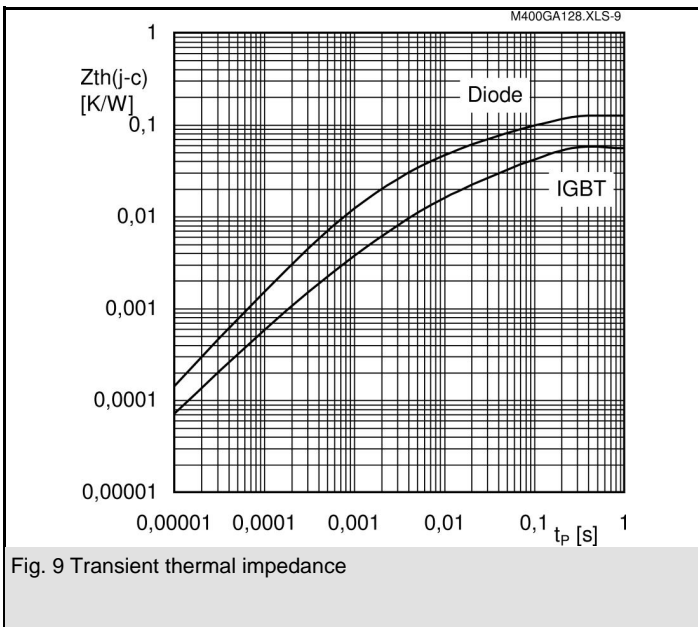
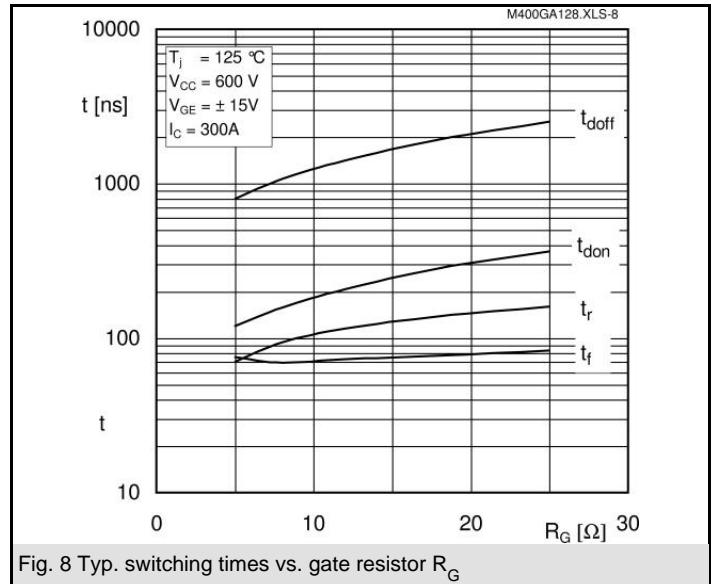
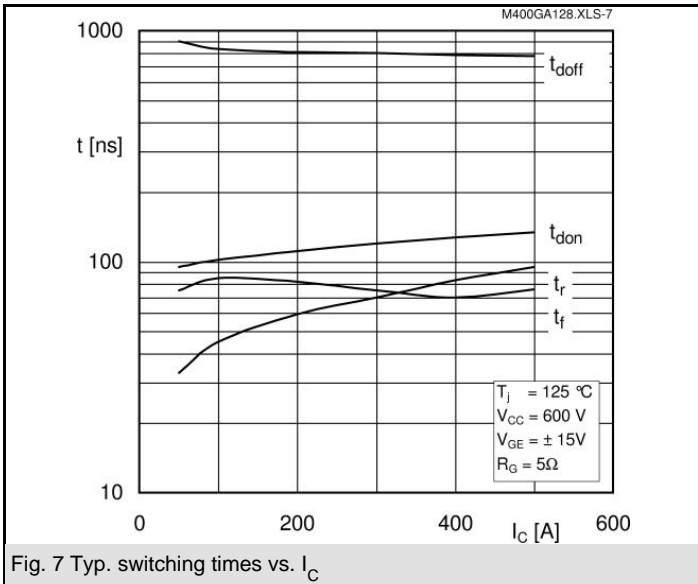
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Characteristics		min.	typ.	max.	Units
Symbol	Conditions				
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}$		2	2,5	V
	$T_j = 25 \text{ °C}_{chiplev.}$				
	$T_j = 125 \text{ °C}_{chiplev.}$		1,8		V
V_{F0}	$T_j = 25 \text{ °C}$		1,1	1,2	V
r_F	$T_j = 25 \text{ °C}$		3	4,3	mΩ
I_{RRM}	$I_{Fnom} = 300 \text{ A}$		345		A
Q_{rr}	$di/dt = 5200 \text{ A}/\mu\text{s}$		48		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		20		mJ
$R_{th(j-c)D}$	per diode			0,125	K/W
Module					
L_{CE}			15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25 \text{ °C}$	0,18		mΩ
		$T_{case} = 125 \text{ °C}$	0,22		mΩ
$R_{th(c-s)}$	per module			0,038	K/W
M_s	to heat sink M6		3	5	Nm
M_t	to terminals M6 (M4)		2,5 (1,1)	5 (2)	Nm
w				330	g

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.



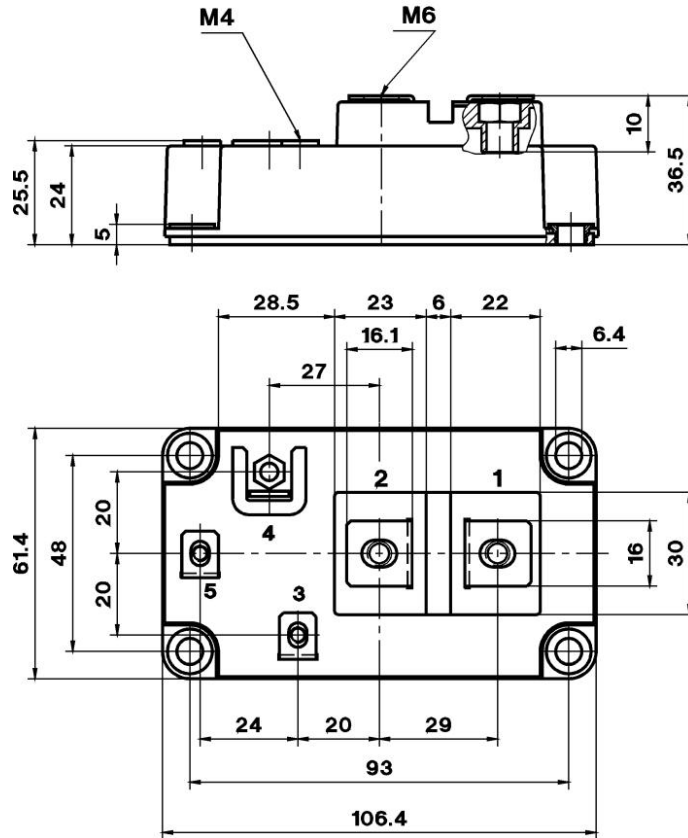


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UL Recognized

CASED59

File 63 532



Case D 59

