



**SEMITRANS™ 2**

## SPT IGBT Module

SKM 145GB128D

SKM 145GAL128D

SKM 145GAR128D

### Features

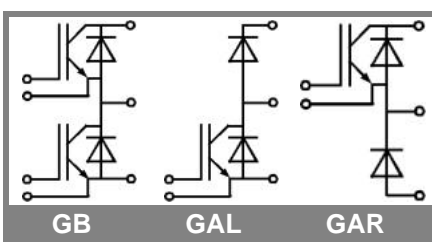
- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CEsat}$  with positive temperature coefficient
- High short circuit capability, self limiting to  $6 \times I_C$

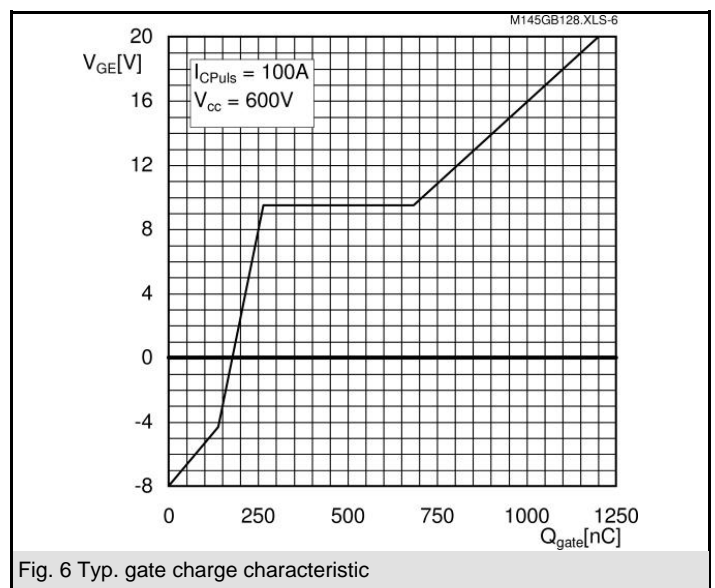
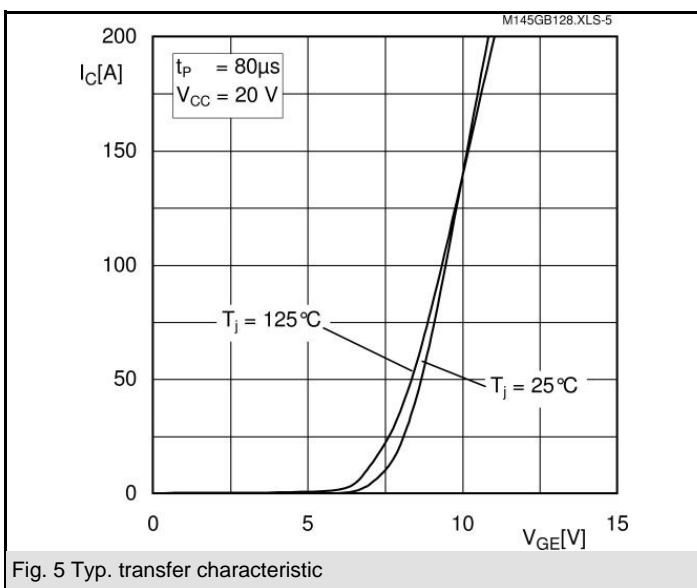
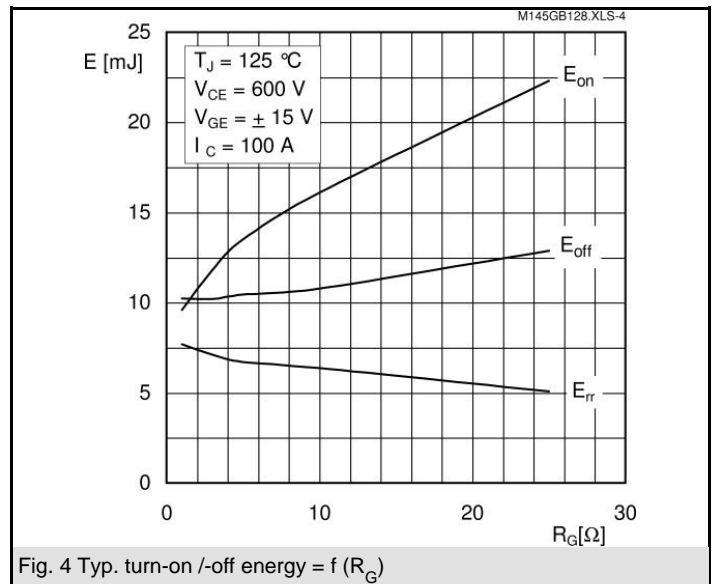
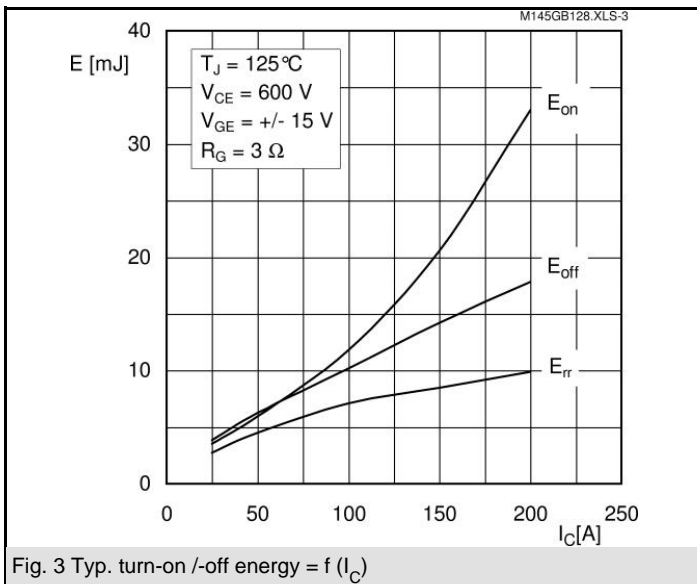
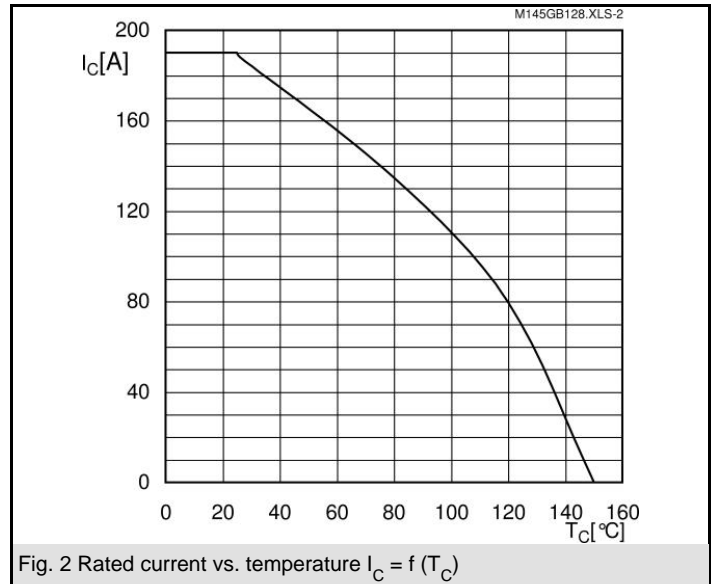
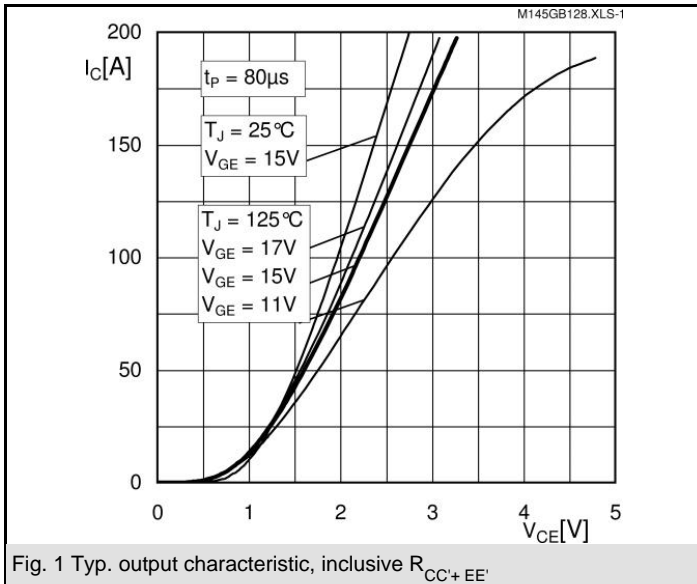
### Typical Applications

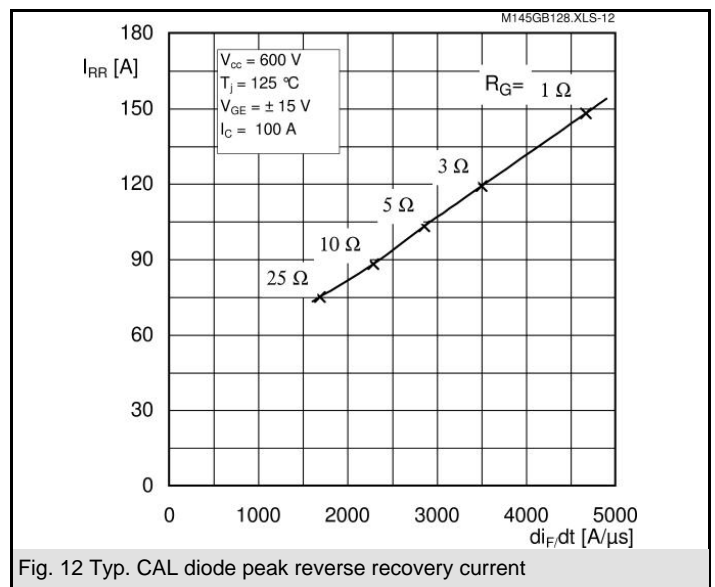
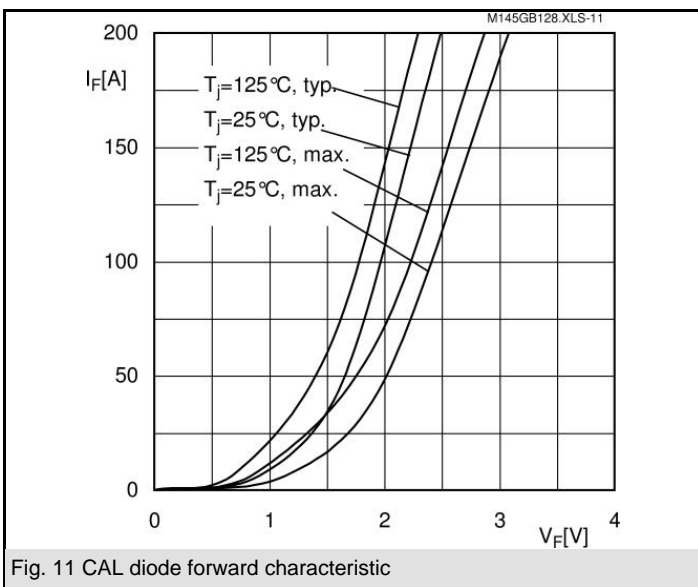
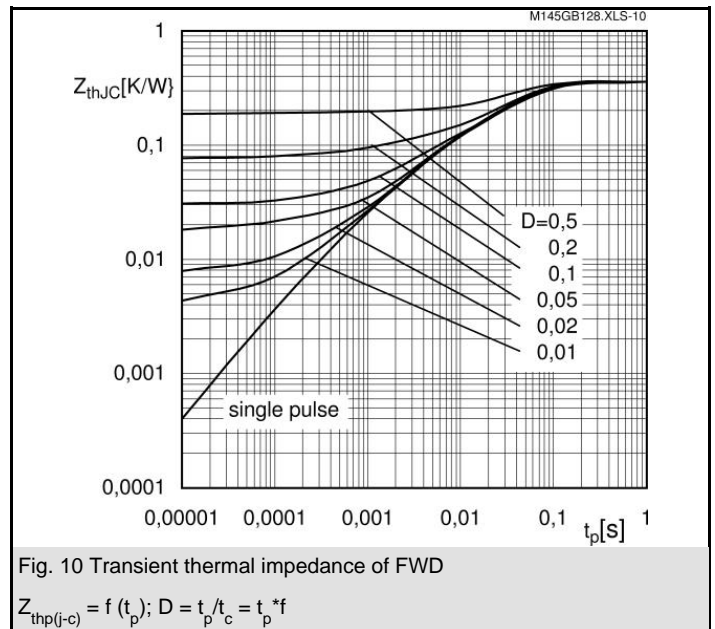
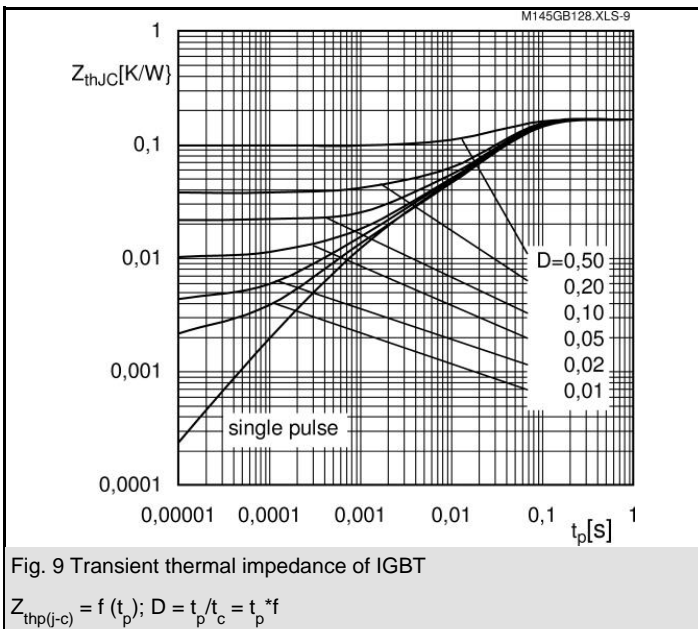
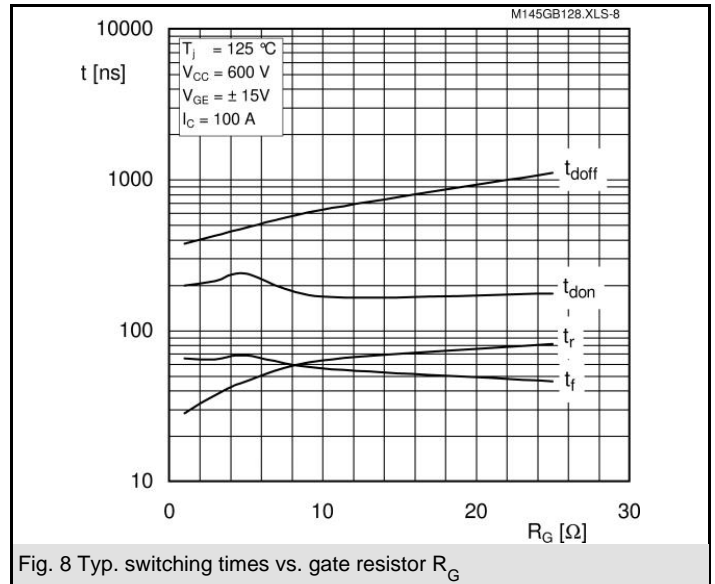
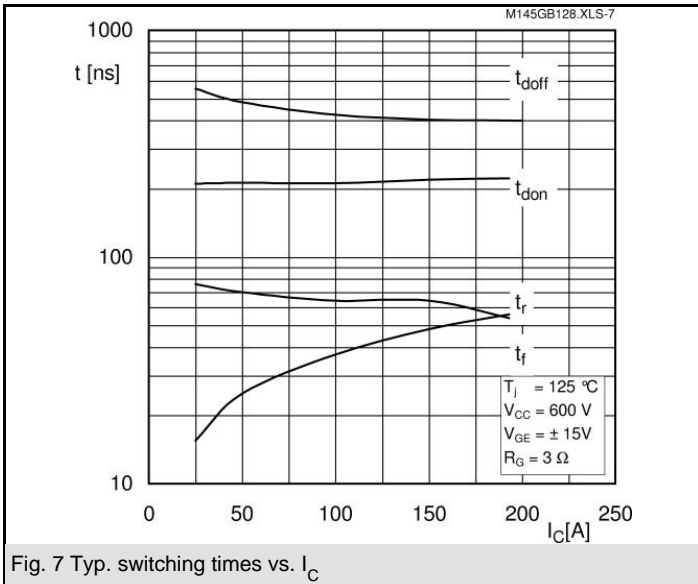
- AC inverter drives
- UPS
- Electronic welders at  $f_{sw}$  up to 20kHz

Absolute Maximum Ratings		$T_c = 25\text{ °C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1200	V
$I_C$	$T_c = 25\text{ (80) °C}$	190 (135)	A
$I_{CRM}$	$T_c = 25\text{ (80) °C}$ , $t_p = 1\text{ ms}$	380 (270)	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	-40 ... +150 (125)	°C
$V_{isol}$	AC, 1 min.	4000	V
<b>Inverse diode</b>			
$I_F$	$T_c = 25\text{ (80) °C}$	130 (90)	A
$I_{FRM}$	$T_c = 25\text{ (80) °C}$ , $t_p = 1\text{ ms}$	350 (260)	A
$I_{FSM}$	$t_p = 10\text{ ms}$ ; sin.; $T_j = 150\text{ °C}$	1100	A

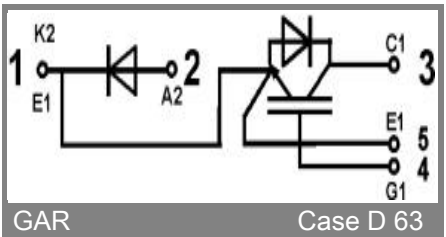
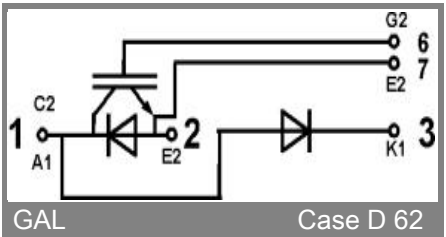
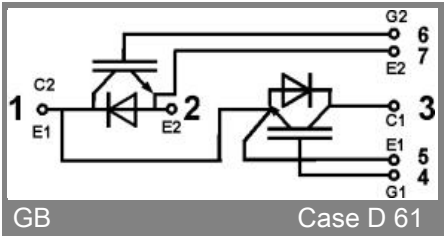
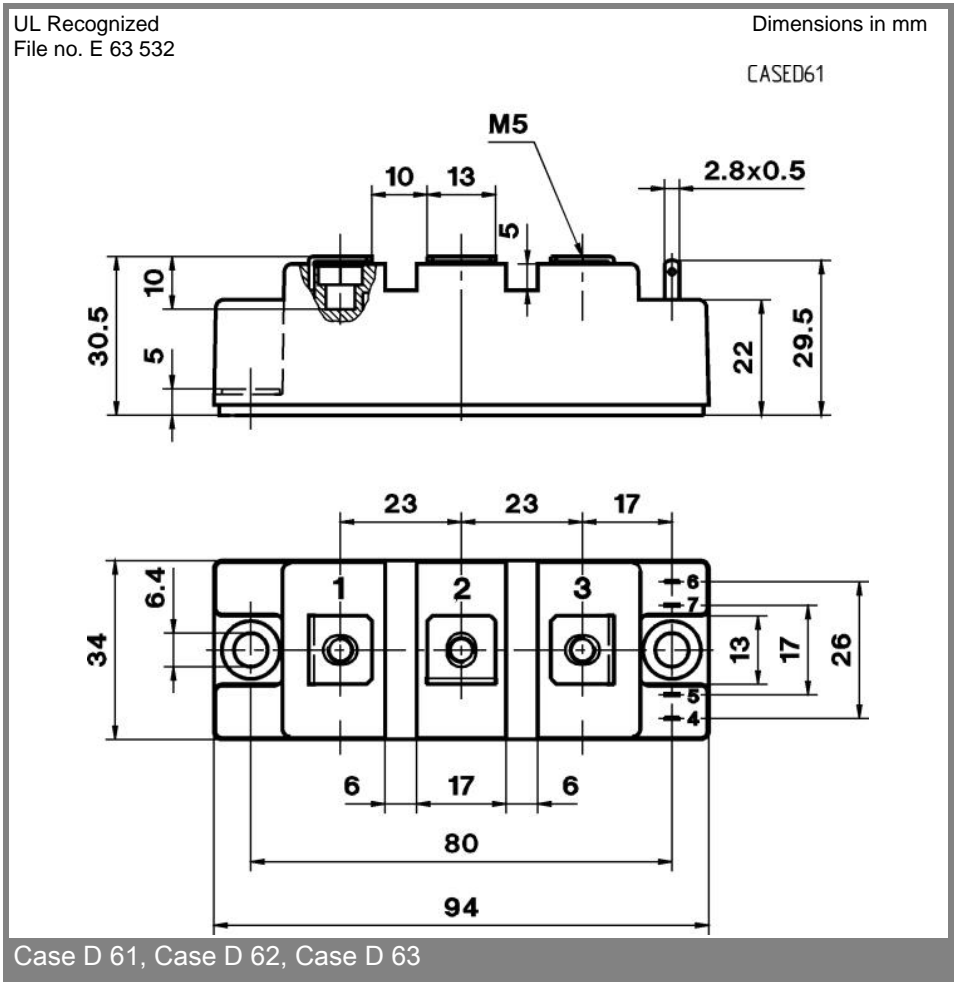
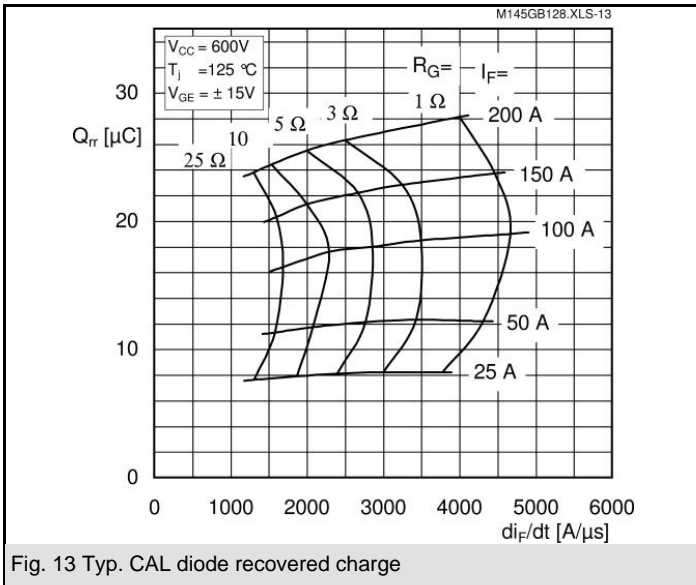
Characteristics		$T_c = 25\text{ °C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ ; $I_C = 4\text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0$ , $V_{CE} = V_{CES}$ ; $T_j = 25\text{ (125) °C}$		0,1	0,3	mA
$V_{CE(TO)}$	$T_j = 25\text{ (125) °C}$		1 (0,9)	1,15 (1,05)	V
$r_{CE}$	$V_{GE} = 15\text{ V}$ , $T_j = 25\text{ (125) °C}$		9 (12)	12 (15)	mΩ
$V_{CE(sat)}$	$I_C = 100\text{ A}$ , $V_{GE} = 15\text{ V}$ , chip level		1,9 (2,1)	2,35 (2,55)	V
$C_{ies}$	under following conditions		9		nF
$C_{oes}$	$V_{GE} = 0$ , $V_{CE} = 25\text{ V}$ , $f = 1\text{ MHz}$		1		nF
$C_{res}$			1		nF
$L_{CE}$				30	nH
$R_{CC'+EE'}$	res., terminal-chip $T_c = 25\text{ (125) °C}$		0,75 (1)		mΩ
$t_{d(on)}$	$V_{CC} = 600\text{ V}$ , $I_C = 100\text{ A}$		210		ns
$t_r$	$R_{Gon} = R_{Goff} = 3\text{ Ω}$ , $T_j = 125\text{ °C}$		40		ns
$t_{d(off)}$	$V_{GE} = \pm 15\text{ V}$		430		ns
$t_f$			65		ns
$E_{on} (E_{off})$			12 (10)		mJ
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_F = 100\text{ A}$ ; $V_{GE} = 0\text{ V}$ ; $T_j = 25\text{ (125) °C}$		2 (1,8)	2,5	V
$V_{(TO)}$	$T_j = 25\text{ (125) °C}$		1,1	1,4	V
$r_T$	$T_j = 25\text{ (125) °C}$		9	13	mΩ
$I_{RRM}$	$I_F = 100\text{ A}$ ; $T_j = 125\text{ ( ) °C}$		120		A
$Q_{rr}$	$di/dt = 3500\text{ A/μs}$		18,5		μC
$E_{rr}$	$V_{GE} = 0\text{ V}$		7		mJ
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	per IGBT			0,165	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,36	K/W
$R_{th(c-s)}$	per module			0,05	K/W
<b>Mechanical data</b>					
$M_s$	to heatsink M6	3		5	Nm
$M_t$	to terminals M5	2,5		5	Nm
w				160	g







# SKM 145GB128D ...



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.