

# 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

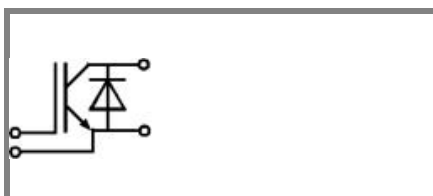
- AC inverter drives
- UPS
- Electronic welders at  $f_{sw}$  up to 20 kHz

### Remarks

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

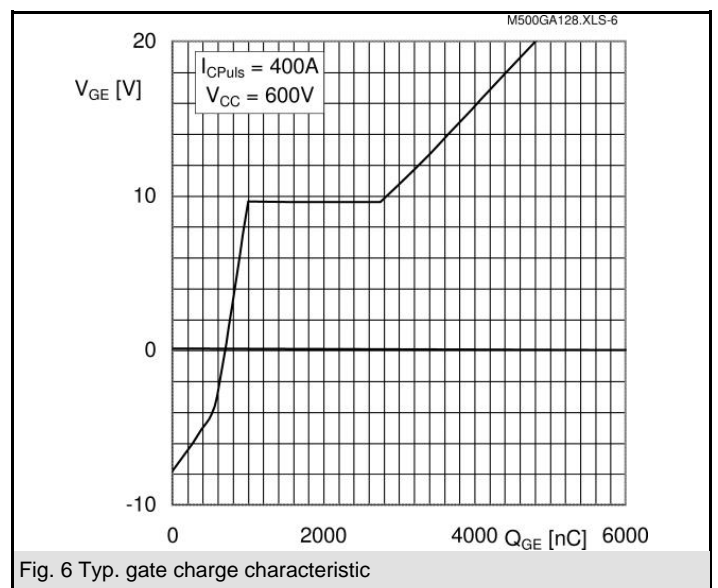
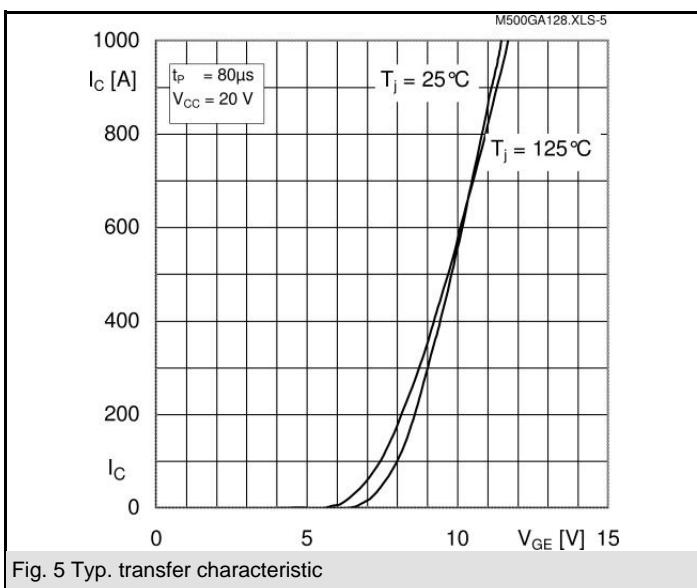
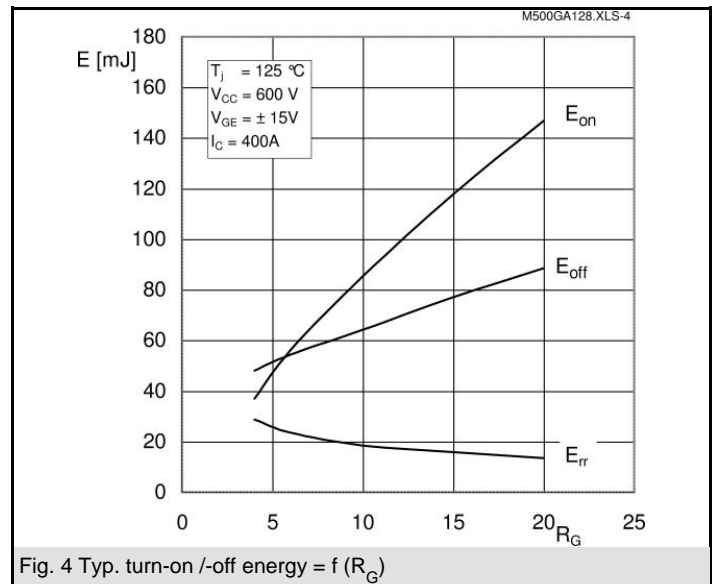
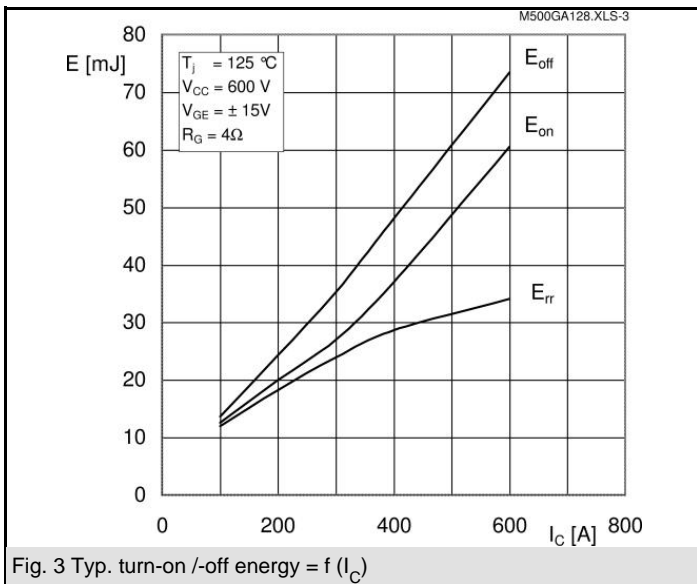
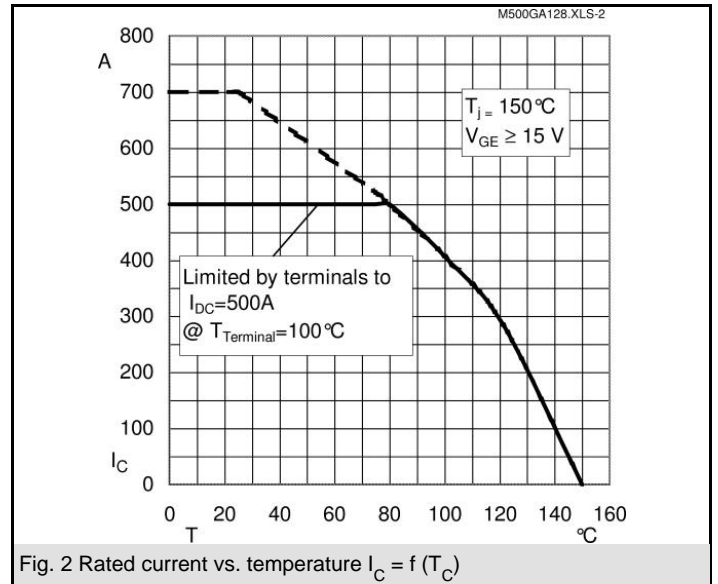
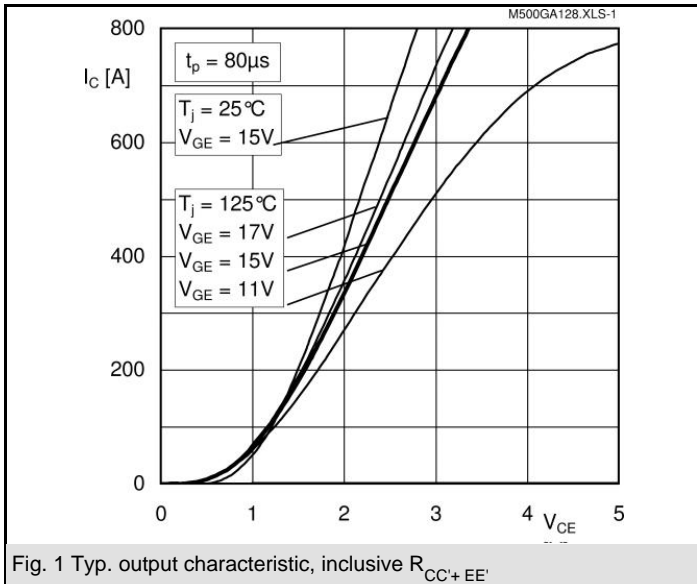
Absolute Maximum Ratings		$T_c = 25$ °C, unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT</b>			
$V_{CES}$		1200	V
$I_C$	$T_c = 25$ (80) °C	700 (500)	A
$I_{CRM}$	$T_c = 25$ (80) °C, $t_p = 1$ ms	1400 (1000)	A
$V_{GES}$		$\pm 20$	V
$T_{vj}$ ( $T_{stg}$ )	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	°C
$V_{isol}$	AC, 1 min.	4000	V
<b>Inverse diode</b>			
$I_F = -I_C$	$T_c = 25$ (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

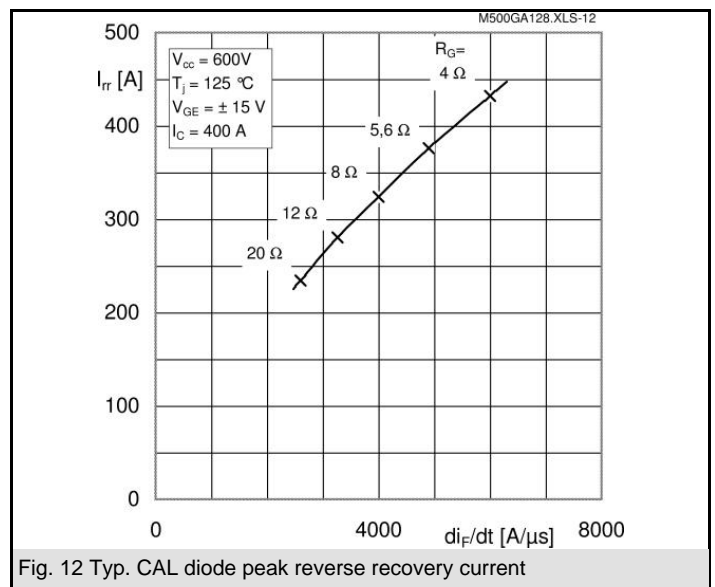
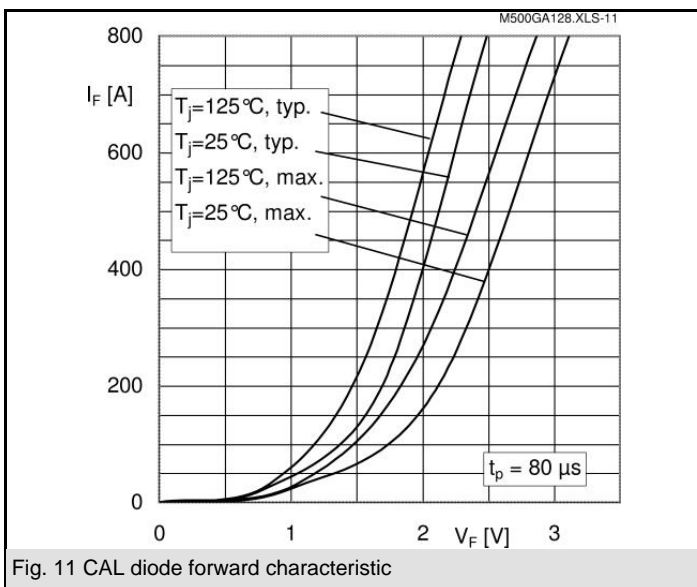
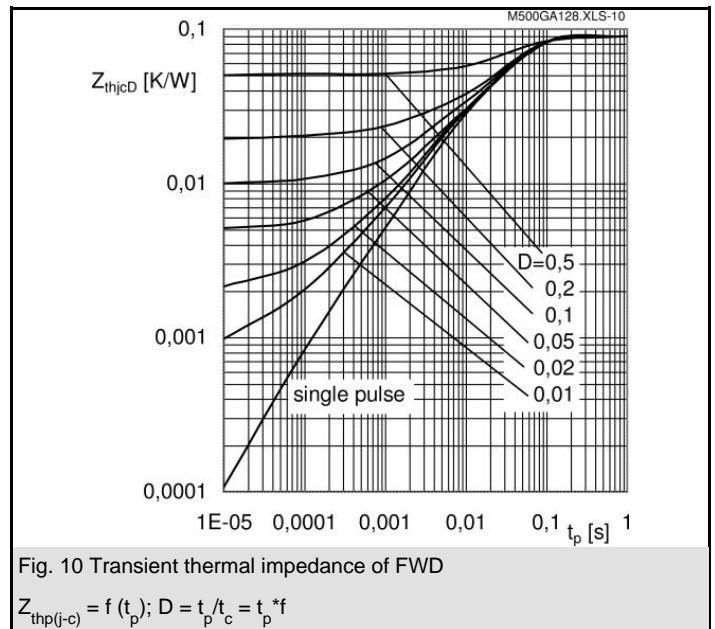
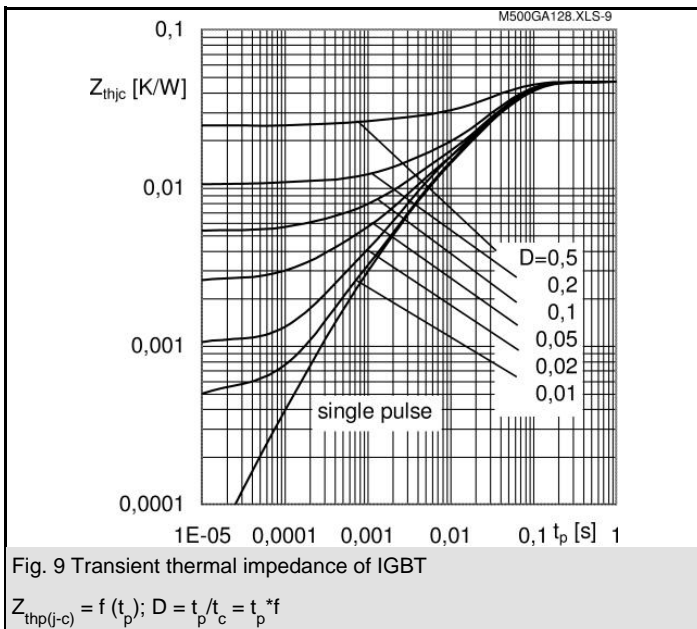
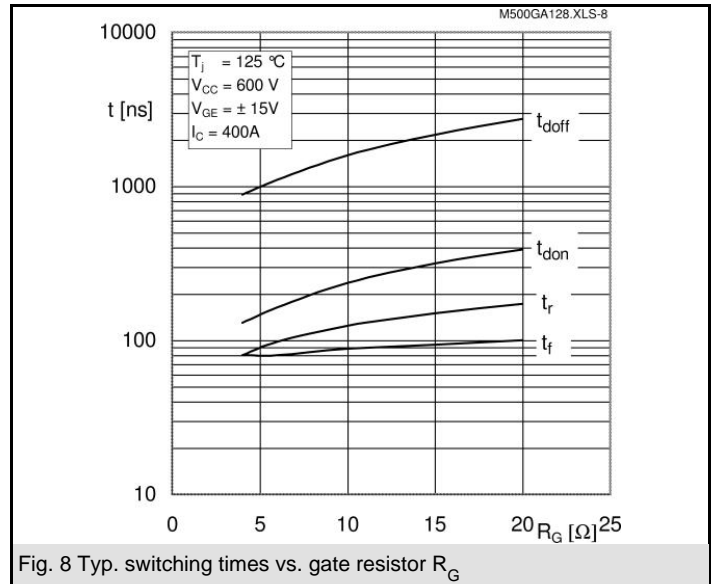
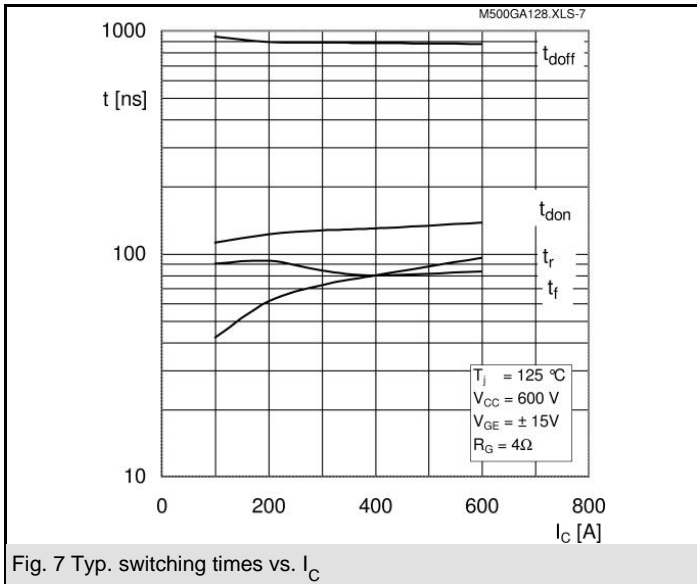
Characteristics		$T_c = 25$ °C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 16$ mA	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0$ , $V_{CE} = V_{CES}$ , $T_j = 25$ ( ) °C		0,2	0,6	mA
$V_{CE(TO)}$	$T_j = 25$ ( ) °C		1 (0,9)	1,15 (1,05)	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
<b>Inverse diode</b>					
$V_F = V_{EC}$	$I_F = 400$ 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
<b>Thermal characteristics</b>					
$R_{th(j-c)}$	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
<b>Mechanical data</b>					
$M_s$	to heatsink M6	3		5	Nm
$M_t$	to terminals M6, M4	2,5		5	Nm
w				330	g



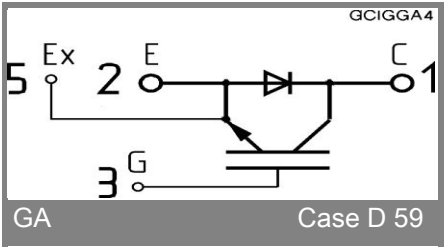
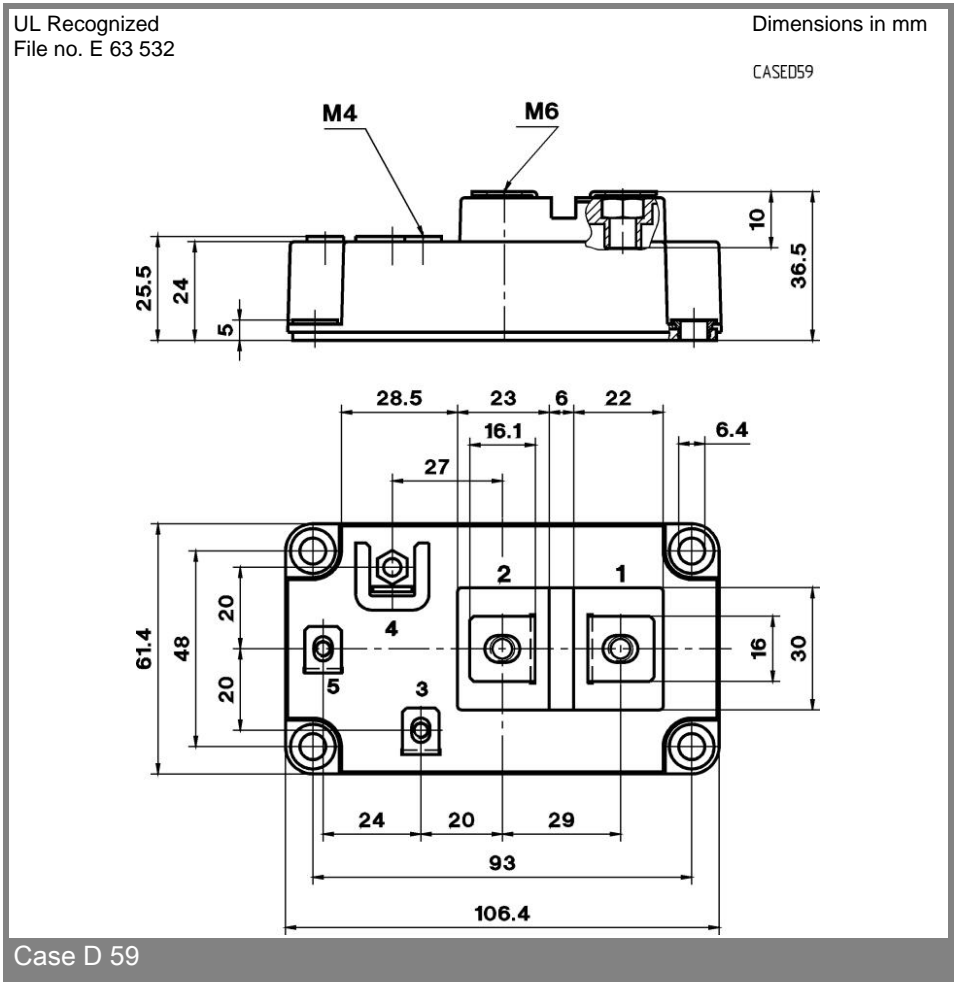
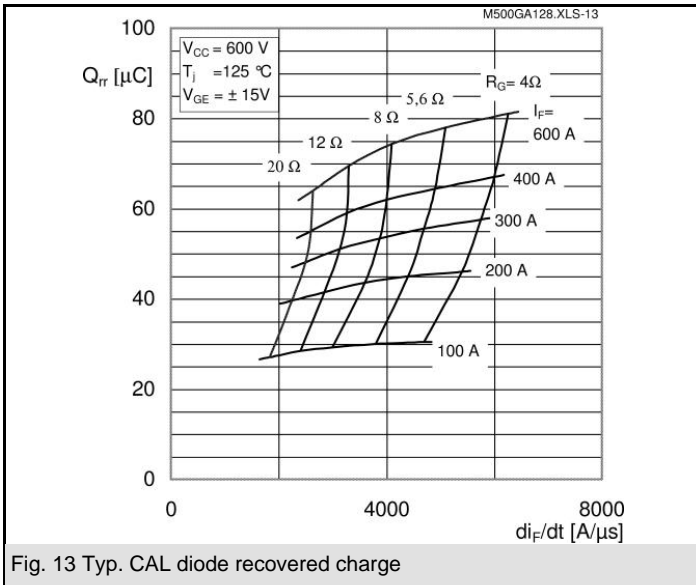
GA

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

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