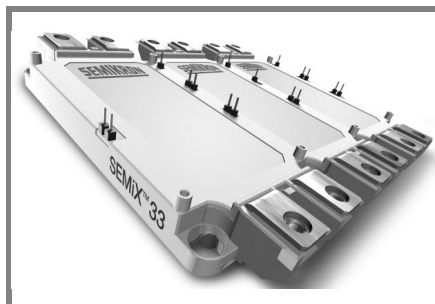




SEMiX® 33c

SPT IGBT Modules

SEMiX 403GD128Dc

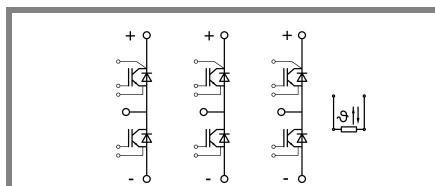
Preliminary Data

Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

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



GD

Absolute Maximum Ratings		$T_{case} = 25^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}		1200	V
I_C	$T_c = 25 (80)^{\circ}\text{C}$	420 (300)	A
I_{CRM}	$T_c = 25 (80)^{\circ}\text{C}$, $t_p = 1 \text{ ms}$	840 (600)	A
V_{GES}		± 20	V
T_{vj} , (T_{stg})	$T_{OPERATION} \leq T_{stg}$	- 40 ... + 150 (125)	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
I_F	$T_c = 25 (80)^{\circ}\text{C}$	340 (230)	A
I_{FRM}	$T_c = 25 (80)^{\circ}\text{C}$, $t_p = 1 \text{ ms}$	840 (600)	A
I_{FSM}	$t_p = 10 \text{ ms}$; sin.; $T_j = 25^{\circ}\text{C}$	2000	A

Characteristics		T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 9 mA	4,5	5	6,5	V
I _{CES}	V _{GE} = 0, V _{CE} = V _{CES} , T _j = 25 (125) °C			0,3	mA
V _{CE(TO)}	T _j = 25 (125) °C		1 (0,9)	1,15 (1,05)	V
r _{CE}	V _{GE} = 15 V, T _j = 25 (125) °C		4 (5,3)	5,3 (6,7)	mΩ
V _{CE(sat)}	I _C = 225 A, V _{GE} = 15 V, T _j = 25 (125) °C, chip level		1,9 (2,1)	2,35 (2,55)	V
C _{ies}	under following conditions		20		nF
C _{oes}	V _{GE} = 0, V _{CE} = 25 V, f = 1 MHz				nF
C _{res}					nF
L _{CE}			20		nH
R _{CC'+EE'}	resistance, terminal-chip, T _c = 25 (125) °C		0,7 (1)		mΩ
t _{d(on)/t_r}	V _{CC} = 600 V, I _C = 225 A		145 / 60		ns
t _{d(off)/t_f}	V _{GE} = ± 15 V		575 / 70		ns
E _{on} (E _{off})	R _{Gon} = R _{Goff} = 4,3 Ω, T _j = 125 °C		19 (22)		mJ
Inverse diode					
V _F = V _{EC}	I _F = 225 A; V _{GE} = 0 V; T _j = 25 (125) °C, chip level		2 (1,8)	2,5 (2,3)	V
V _(TO)	T _j = 25 (125) °C		1,1	1,2	V
r _T	T _j = 25 (125) °C		4	5,8	mΩ
I _{RRM}	I _F = 225 A; T _j = 25 (125) °C		(260)		A
Q _{rr}	di/dt = 4950 A/μs		(29)		μC
E _{rr}	V _{GE} = -15 V		(10)		mJ
Thermal characteristics					
R _{th(j-c)}	per IGBT			0,075	K/W
R _{th(j-c)D}	per Inverse Diode			0,133	K/W
R _{th(j-c)FD}	per FWD				K/W
R _{th(c-s)}	per module		0,014		K/W
Temperature sensor					
R ₂₅	T _c = 25 °C		5 ±5%		kΩ
B _{25/85}	R ₂ =R ₁ exp[B(1/T ₂ -1/T ₁)] ; T[K];B		3420		K
Mechanical data					
M _s /M _t	to heatsink (M5) / for terminals (M6)	3/2,5		5 /5	Nm
w			866		g

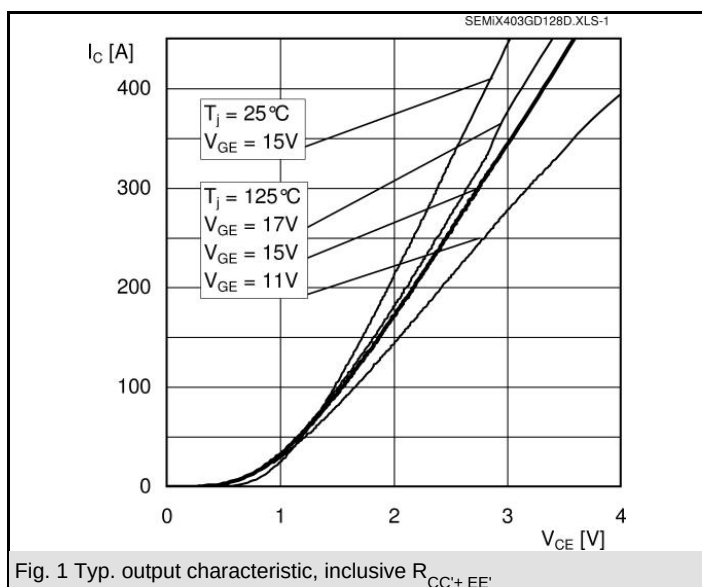
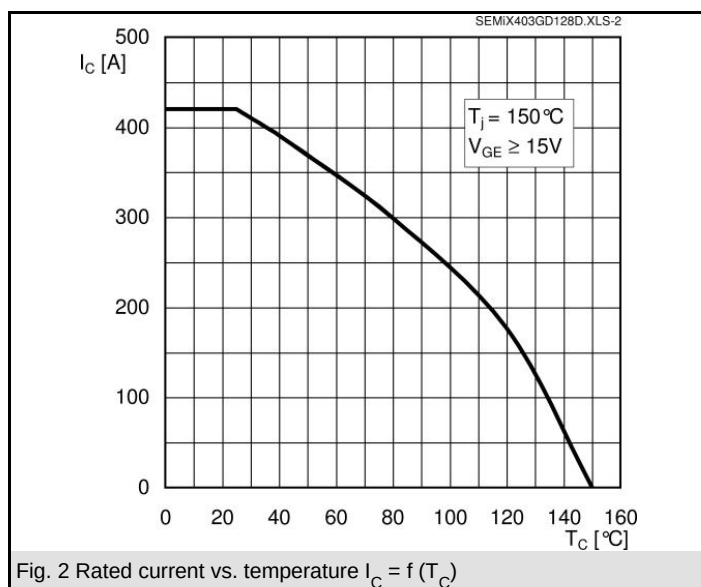
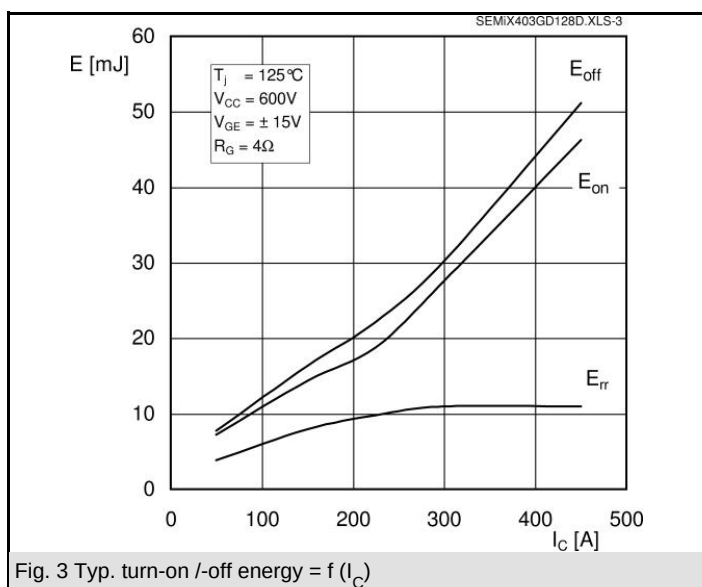
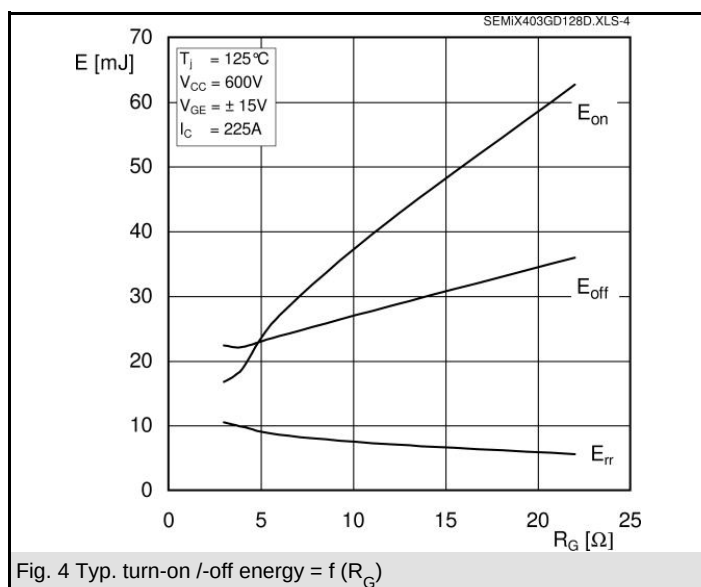
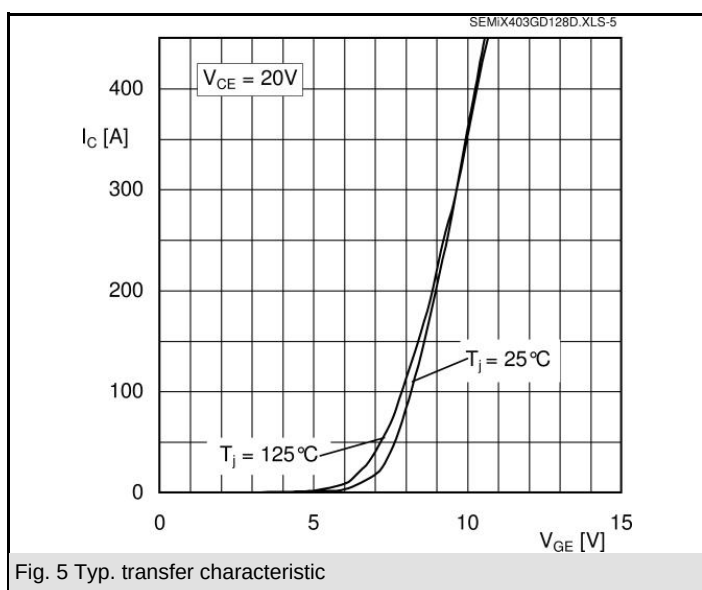

 Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

 Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

 Fig. 3 Typ. turn-on /off energy = $f(I_C)$

 Fig. 4 Typ. turn-on /off energy = $f(R_G)$


Fig. 5 Typ. transfer characteristic

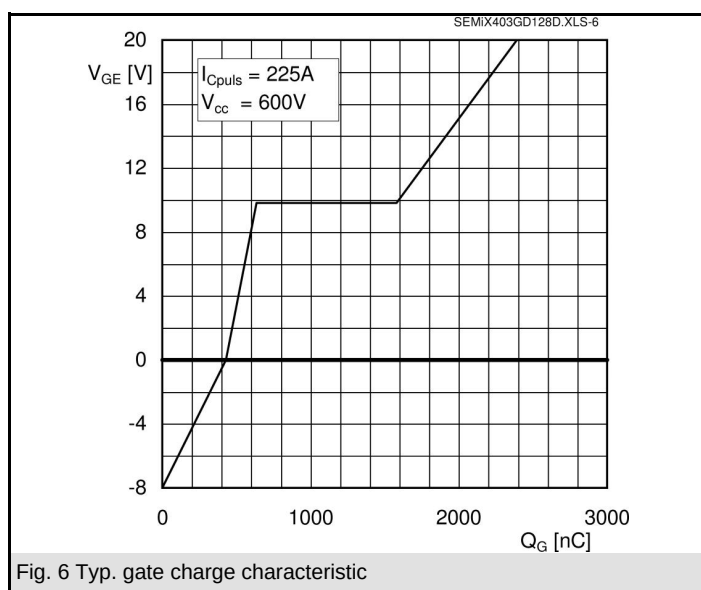
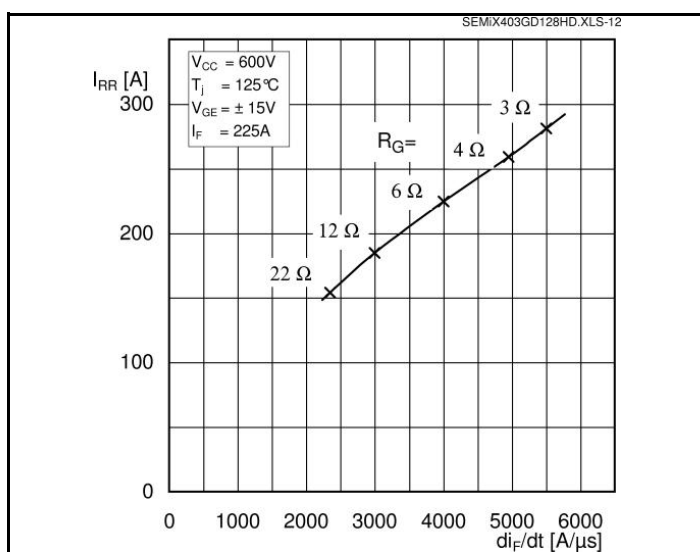
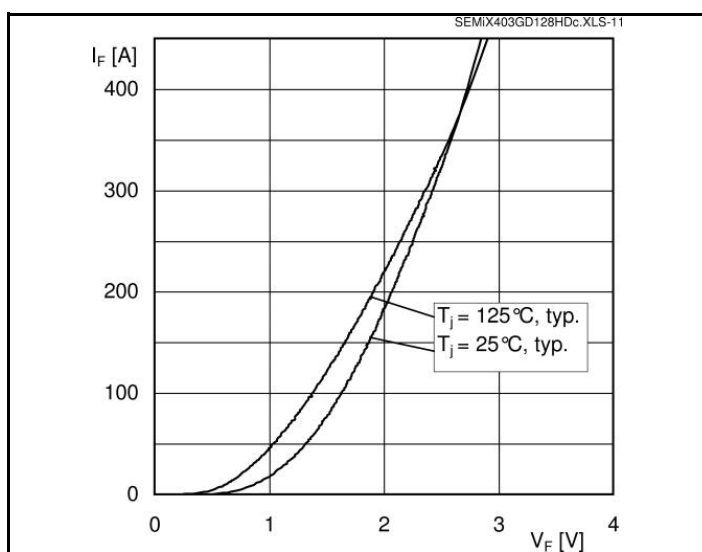
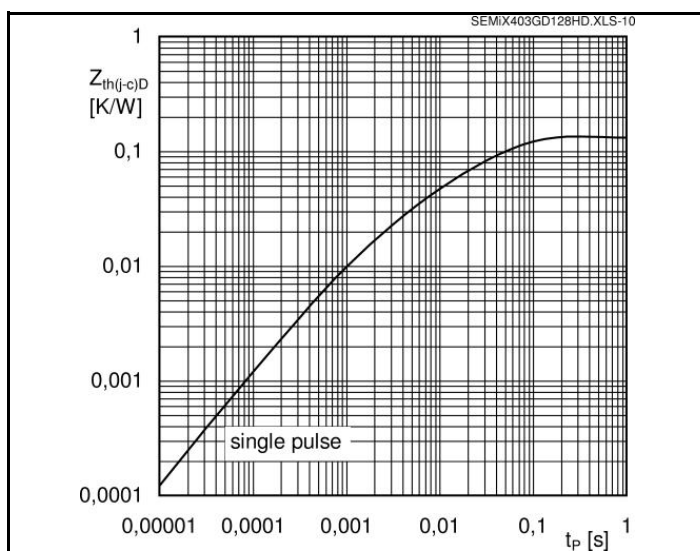
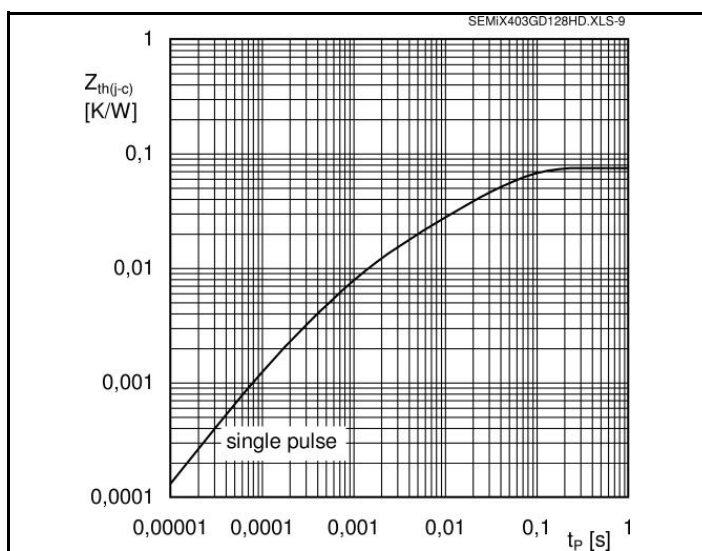
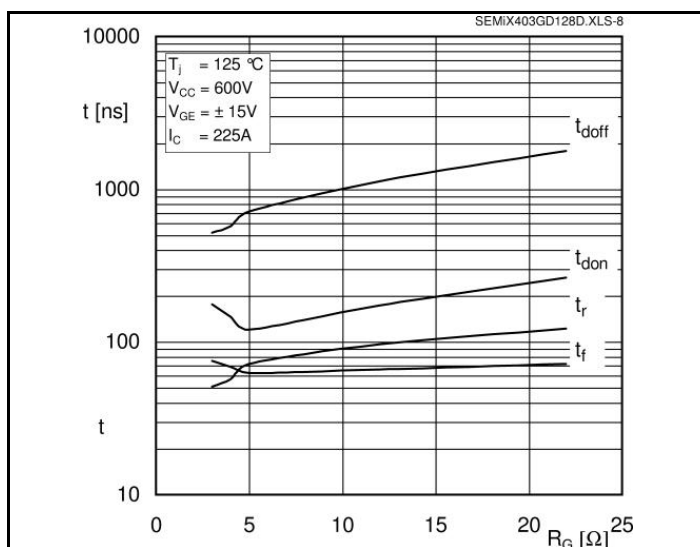
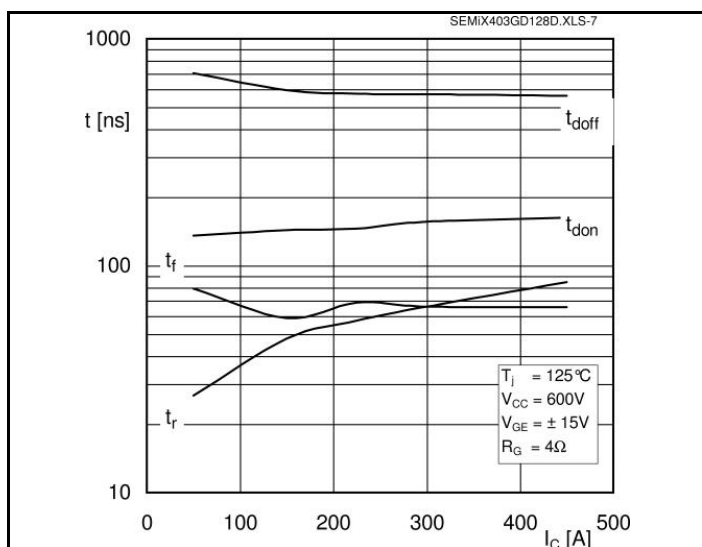
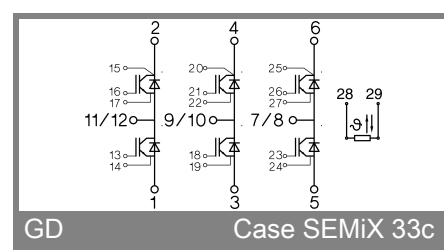
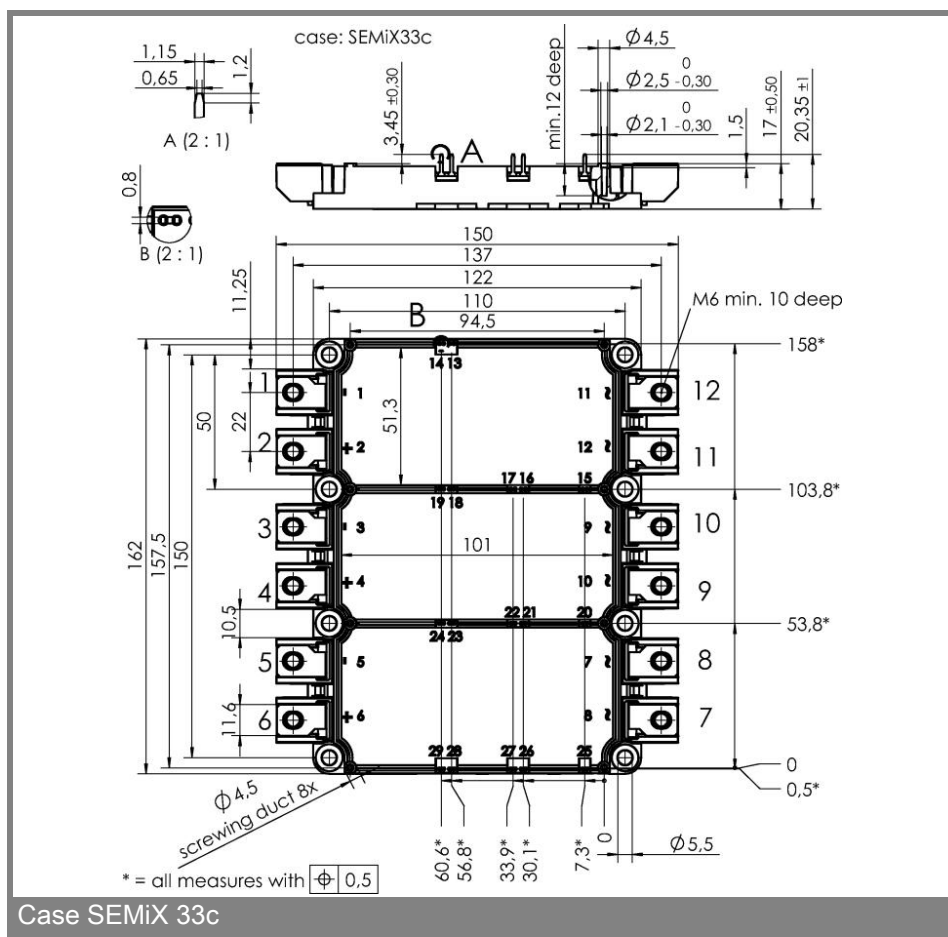
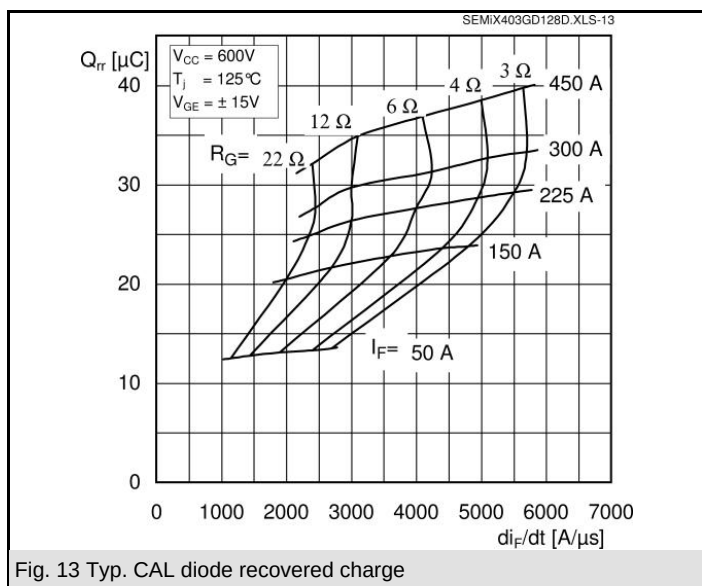


Fig. 6 Typ. gate charge characteristic





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.