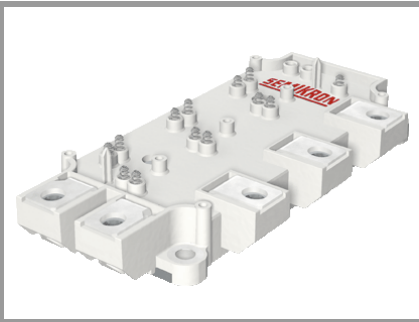




SEMiX®13

SPT IGBT Modules

SEMiX201GD128Ds

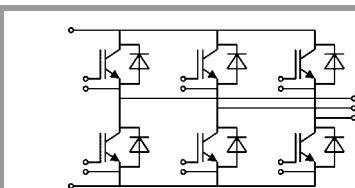
Preliminary Data

Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications

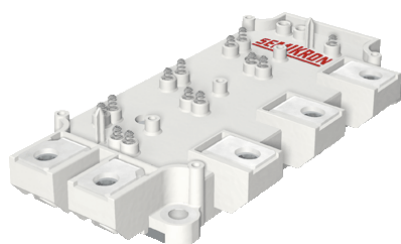
- AC inverter drives
- UPS
- Electronic welders up to 20 kHz



GD

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
IGBT				
V _{CES}			1200	V
I _C	T _j = 150 °C	T _c = 25 °C	200	A
		T _c = 80 °C	142	A
I _{Cnom}			100	A
I _{CRM}	I _{CRM} = 2xI _{Cnom}		200	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{CC} = 600 V V _{GE} ≤ 20 V T _j = 125 °C V _{CES} ≤ 1200 V		10	µs
T _j			-40 ... 150	°C
Inverse diode				
I _F	T _j = 150 °C	T _c = 25 °C	156	A
		T _c = 80 °C	107	A
I _{Fnom}			100	A
I _{FRM}	I _{FRM} = 2xI _{Fnom}		200	A
I _{FSM}	t _p = 10 ms, sin 180°, T _j = 25 °C		1100	A
T _j			-40 ... 150	°C
Module				
I _{t(RMS)}			600	A
T _{stg}			-40 ... 125	°C
V _{isol}	AC sinus 50Hz, t = 1 min		4000	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
V _{CE(sat)}	I _C = 100 A	T _j = 25 °C		1.9	2.35	V
	V _{GE} = 15 V chiplevel	T _j = 125 °C		2.10	2.55	V
V _{CE0}		T _j = 25 °C		1	1.15	V
		T _j = 125 °C		0.9	1.05	V
r _{CE}	V _{GE} = 15 V	T _j = 25 °C		9.0	12.0	mΩ
		T _j = 125 °C		12.0	15.0	mΩ
V _{GE(th)}	V _{GE} =V _{CE} , I _C = 4 mA		4.5	5	6.5	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C		0.1	0.3	mA
	V _{CE} = 1200 V	T _j = 125 °C				mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		9.4		nF
C _{oes}		f = 1 MHz		0.62		nF
C _{res}		f = 1 MHz		0.39		nF
Q _G	V _{GE} = - 8 V...+ 15 V			960		nC
R _{Gint}	T _j = 25 °C			4.00		Ω
t _{d(on)}	V _{CC} = 600 V I _C = 100 A T _j = 125 °C R _{G on} = 4 Ω R _{G off} = 4 Ω			250		ns
t _r				45		ns
E _{on}				10		mJ
t _{d(off)}				445		ns
t _f				60		ns
E _{off}				11		mJ
R _{th(j-c)}		per IGBT				0.15
R _{th(j-s)}	per IGBT					K/W



SEMiX®13

SPT IGBT Modules

SEMiX201GD128Ds

Preliminary Data

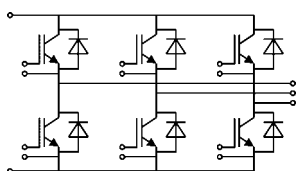
Features

- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability
- UL recognised file no. E63532

Typical Applications

- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

Characteristics					
Symbol	Conditions		min.	typ.	max. Unit
Inverse diode					
$V_F = V_{EC}$	$I_F = 100\text{ A}$ $V_{GE} = 0\text{ V}$ chiplevel	$T_j = 25\text{ °C}$		2.0	2.5 V
		$T_j = 125\text{ °C}$		1.8	2.3 V
V_{F0}		$T_j = 25\text{ °C}$	0.75	1.1	1.45 V
		$T_j = 125\text{ °C}$	0.5	0.85	1.2 V
r_F		$T_j = 25\text{ °C}$	7.5	9.0	10.5 mΩ
		$T_j = 125\text{ °C}$	8.0	9.5	11.0 mΩ
I_{RRM}	$I_F = 100\text{ A}$	$T_j = 125\text{ °C}$		120	A
Q_{rr}	$di/dt_{off} = 3300\text{ A/μs}$ $V_{GE} = -15\text{ V}$	$T_j = 125\text{ °C}$		14	μC
E_{rr}	$V_{CC} = 600\text{ V}$	$T_j = 125\text{ °C}$		4.9	mJ
$R_{th(j-c)}$	per diode				0.28 K/W
$R_{th(j-s)}$	per diode				K/W
Module					
L_{CE}				20	nH
$R_{CC'+EE'}$	res., terminal-chip	$T_C = 25\text{ °C}$		0.7	mΩ
		$T_C = 125\text{ °C}$		1	mΩ
$R_{th(c-s)}$	per module			0.04	K/W
M_s	to heat sink (M5)		3		5 Nm
M_t	to terminals (M6)		2.5		5 Nm
					Nm
w					350 g
Temperature sensor					
R_{100}	$T_C = 100\text{ °C}$ ($R_{25} = 5\text{ kΩ}$)			0,493 ±5%	kΩ
$B_{100/125}$	$R_{(T)} = R_{100} \exp[B_{100/125}(1/T - 1/T_{100})]$; $T[K]$;			3550 ±2%	K



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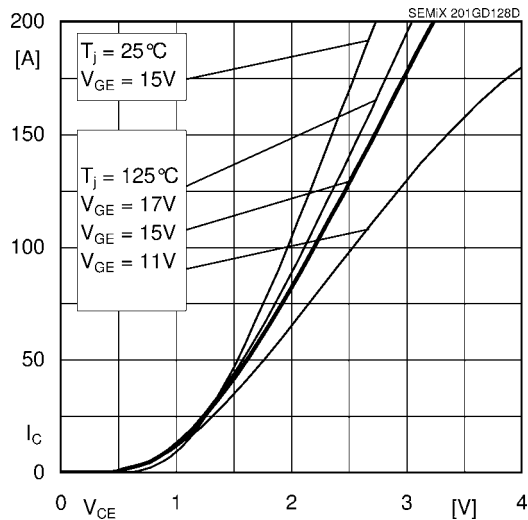


Fig. 1 Typ. output characteristic, inclusive $R_{CC'}+EE'$

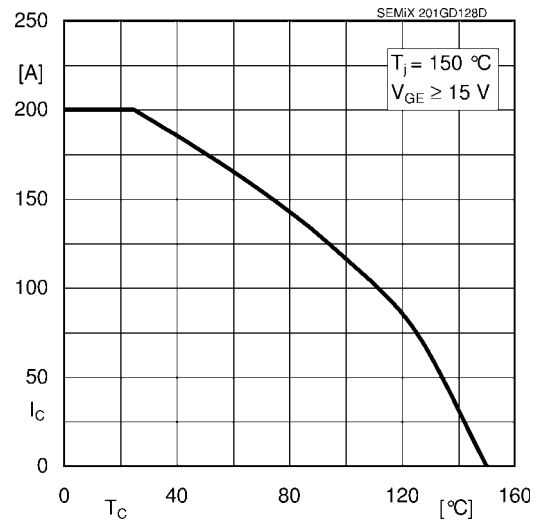


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

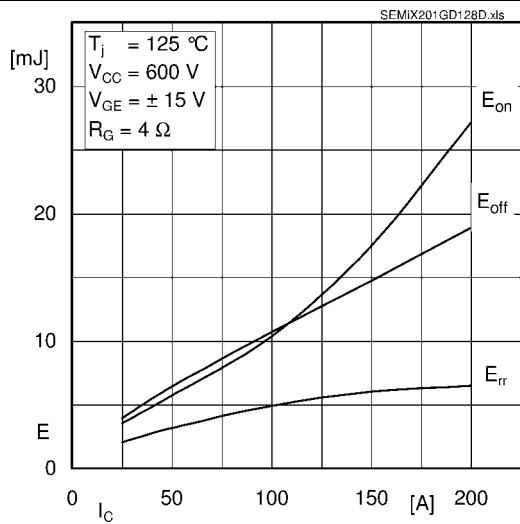


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

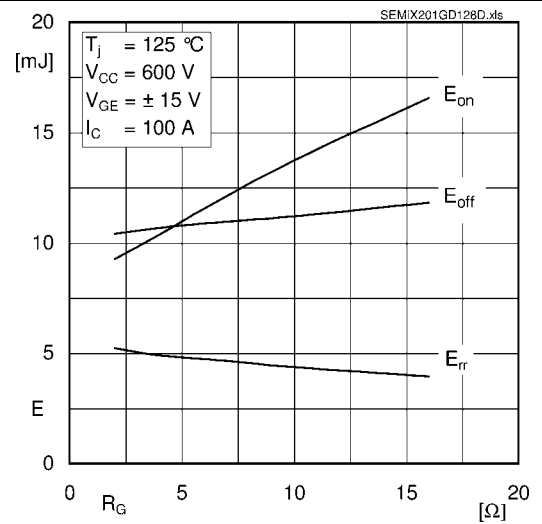


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

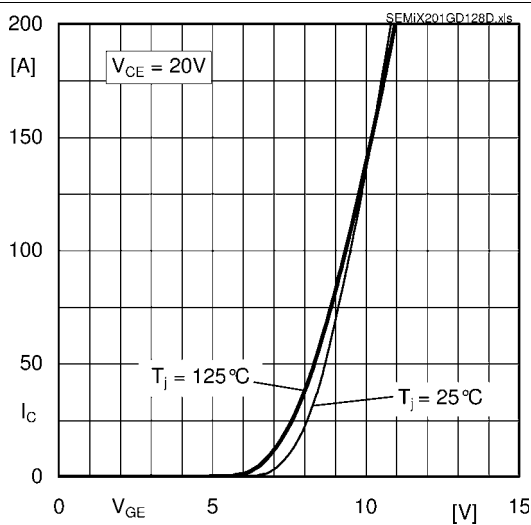


Fig. 5 Typ. transfer characteristic

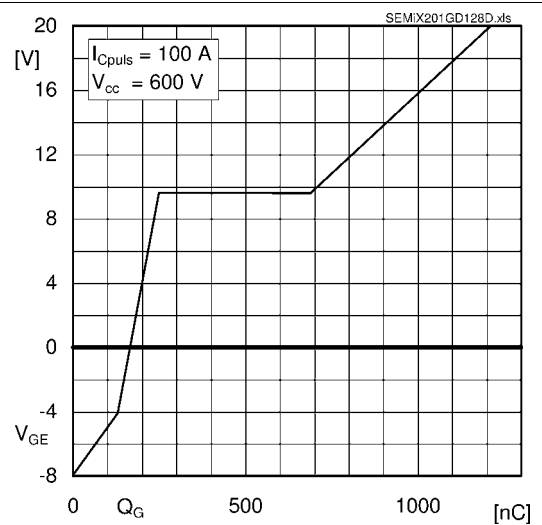
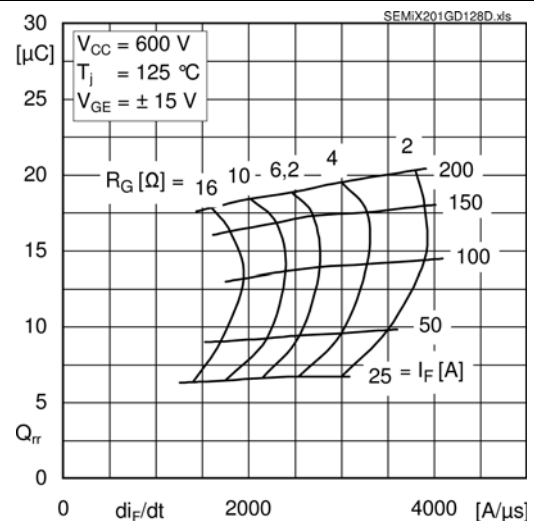
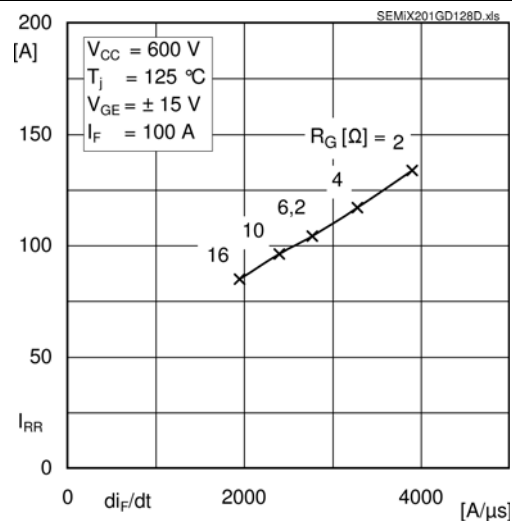
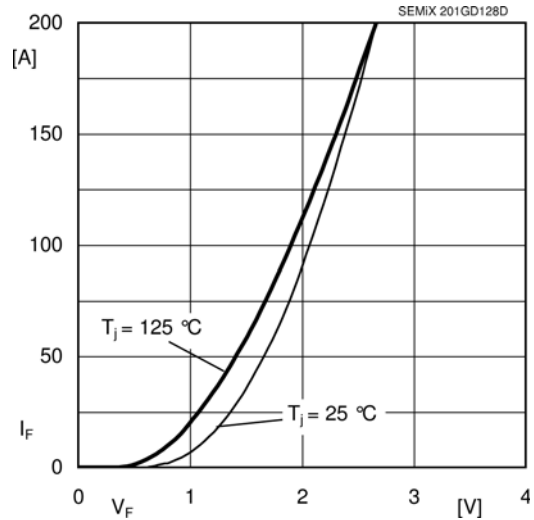
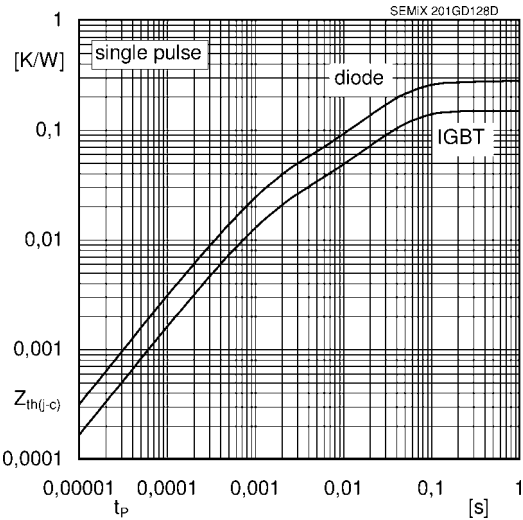
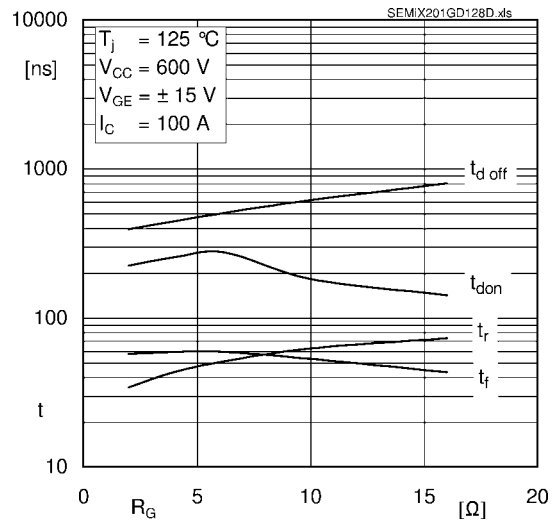
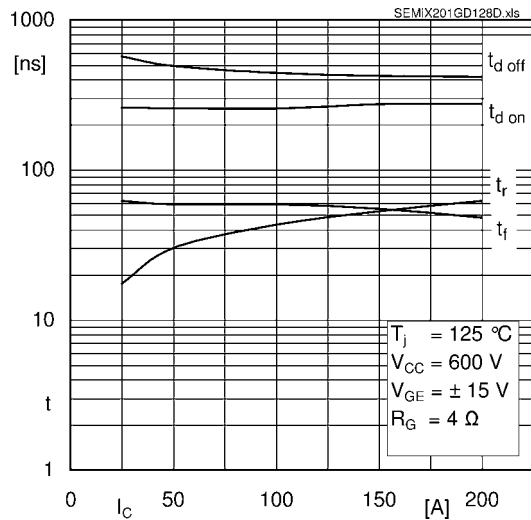
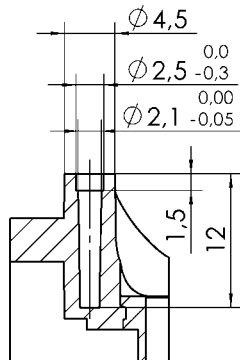


Fig. 6 Typ. gate charge characteristic

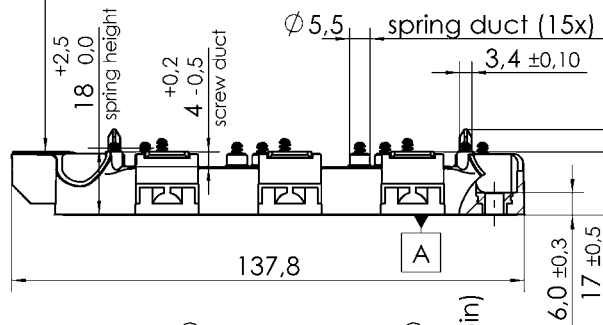


case: SEMiX 13

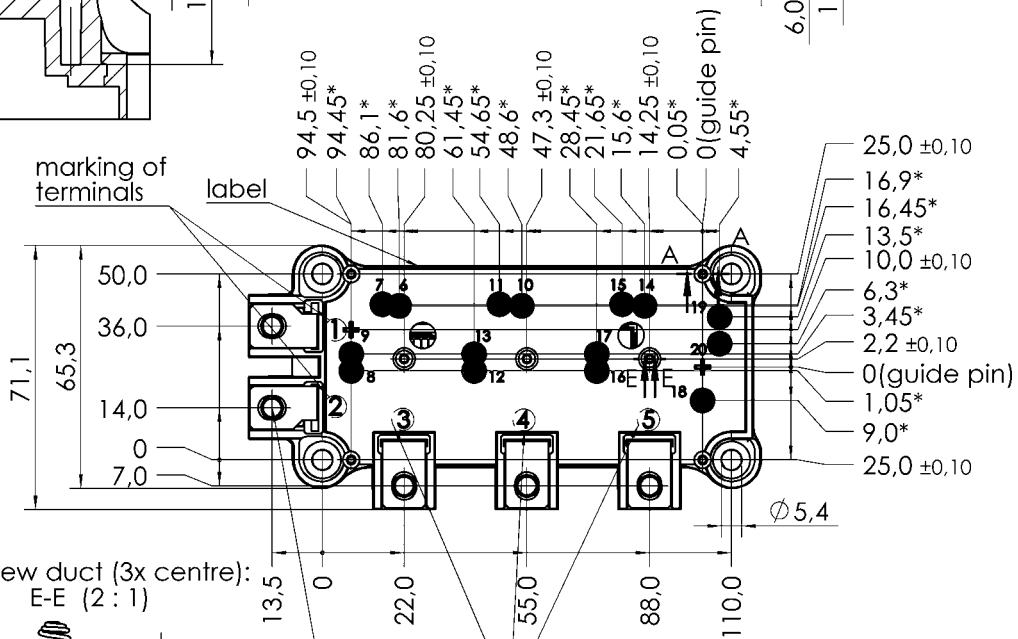
screw duct (4x):
A-A (2:1)



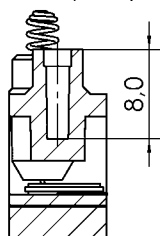
	0,3	main terminal +, -, / ~, ~
	0,2	A



All measures in Z-direction
valid as mounted to heat sink



screw duct (3x centre):
E-E (2:1)



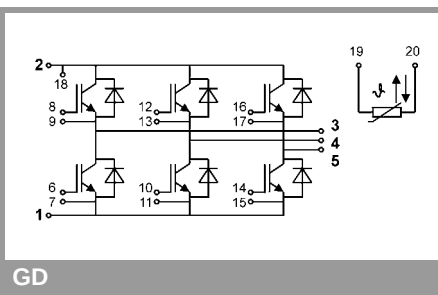
M6- max
10 deep

marking of
terminals

* all measures with $\pm 0,2$

Rules for the contact PCB:
- spring landing pad = $\varnothing 3,5 \pm 0,2$
- holes guidepins = $\varnothing 4 \pm 0,1$

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

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