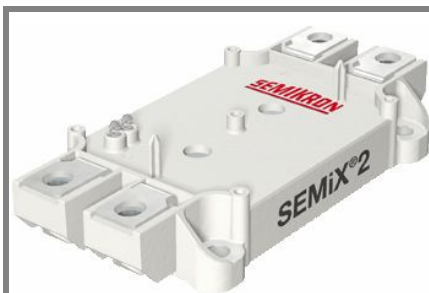


SEMiX 402GB066HDs



SEMiX® 2s

Trench IGBT Modules

SEMiX 402GB066HDs

SEMiX 402GAL066HDs

SEMiX 402GAR066HDs

Preliminary Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient

Typical Applications

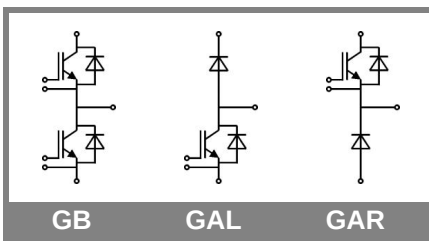
- Matrix Converter
- Resonant Inverter
- Current Source Inverter

Remarks

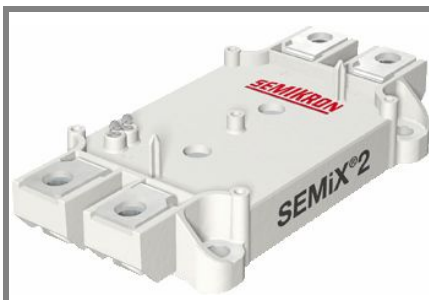
- Case temperature limited to $T_C = 125^\circ\text{C}$ max.
- Product reliability results are valid for $T_J = 150^\circ\text{C}$
- use of soft RG necessary
- take care of over-voltage caused by stray inductance

Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V _{CES}	T _j = 25 °C	600	V	
I _C	T _j = 175 °C	T _c = 25 °C	505	A
		T _c = 80 °C	380	A
I _{CRM}	I _{CRM} =2xI _{Cnom}	800	A	
V _{GES}		± 20	V	
t _{psc}	V _{CC} = 360 V; V _{GE} ≤ 15 V; T _j = 150 °C V _{CES} < 600 V	6	μs	
Inverse Diode				
I _F	T _j = 175 °C	T _c = 25 °C	540	A
		T _c = 80 °C	395	A
I _{FRM}	I _{FRM} =2xI _{Fnom}	800	A	
I _{FSM}	t _p = 10 ms; sin.	T _j = 25 °C	1800	A
Module				
I _{t(RMS)}		600	A	
T _{vj}		- 40 ... + 175	°C	
T _{stg}		- 40 ... + 125	°C	
V _{isol}	AC, 1 min.	4000	V	

Characteristics		T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT					
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 6,4 mA		5,8		V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C			0,45	mA
V _{CE0}	T _j = 25 °C		0,9	1	V
		T _j = 150 °C	0,85	0,9	V
r _{CE}	V _{GE} = 15 V	T _j = 25°C	1,4	2,25	mΩ
		T _j = 150°C	2,15	3	mΩ
V _{CE(sat)}	I _{Cnom} = 400 A, V _{GE} = 15 V	T _j = 25°C _{chiplev.}	1,45	1,9	V
		T _j = 150°C _{chiplev.}	1,7	2,1	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		25		nF
C _{oes}			1,5		nF
C _{res}			0,8		nF
Q _G	V _{GE} = -8 ... +15V		3200		nC
t _{d(on)}	R _{Gon} = 4,5 Ω	V _{CC} = 300V I _{Cnom} = 400A T _j = 150 °C	150		ns
t _r			125		ns
E _{on}	22			mJ	
t _{d(off)}	R _{Goff} = 4,5 Ω		900		ns
t _f			65		ns
E _{off}		24		mJ	
R _{th(j-c)}	per IGBT			0,12	K/W



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Preliminary Data

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- $V_{CE(sat)}$ with positive temperature coefficient

Typical Applications

- Matrix Converter
- Resonant Inverter
- Current Source Inverter

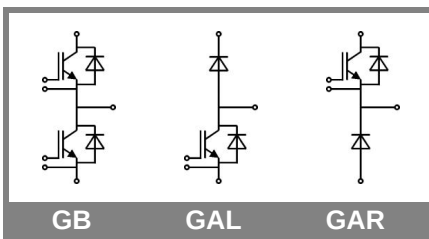
Remarks

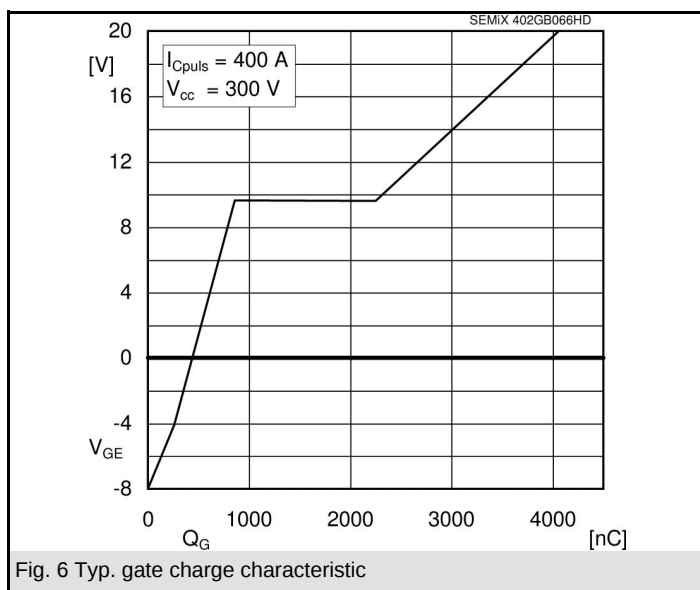
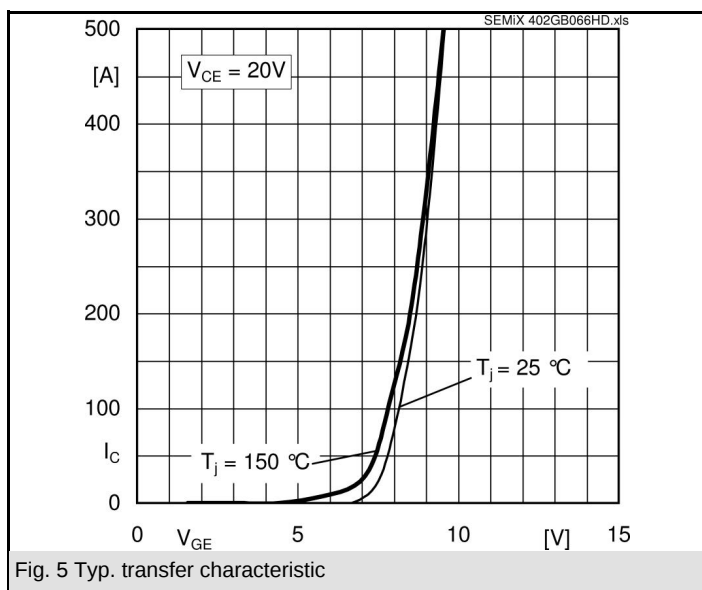
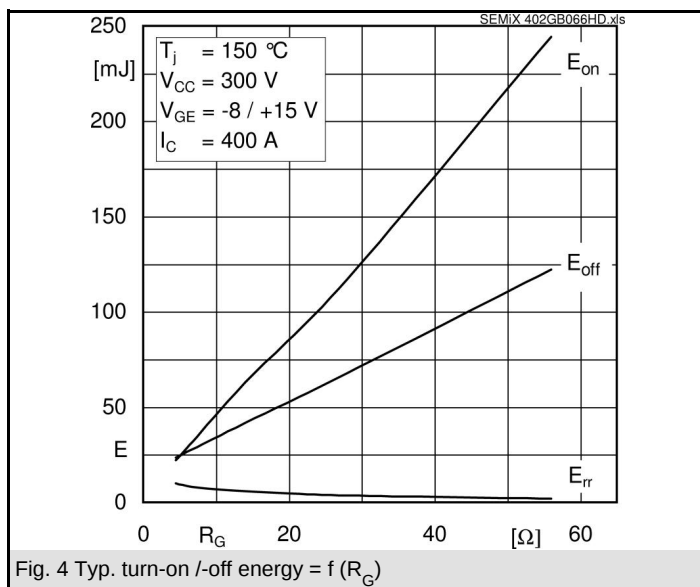
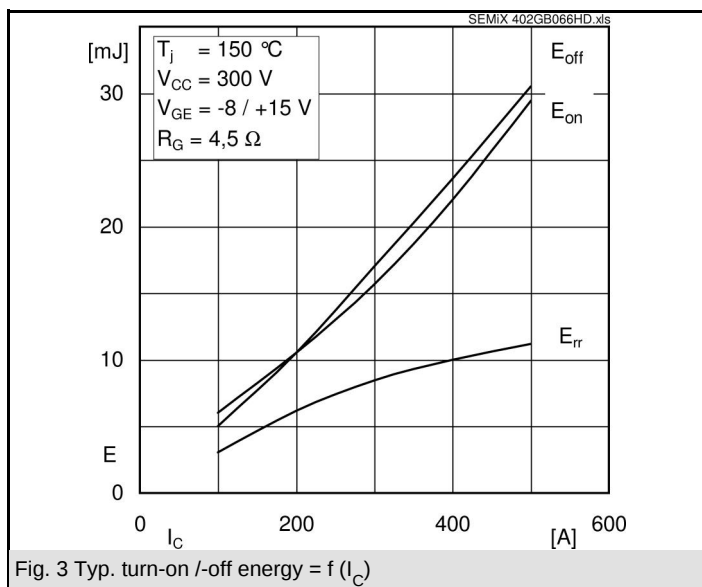
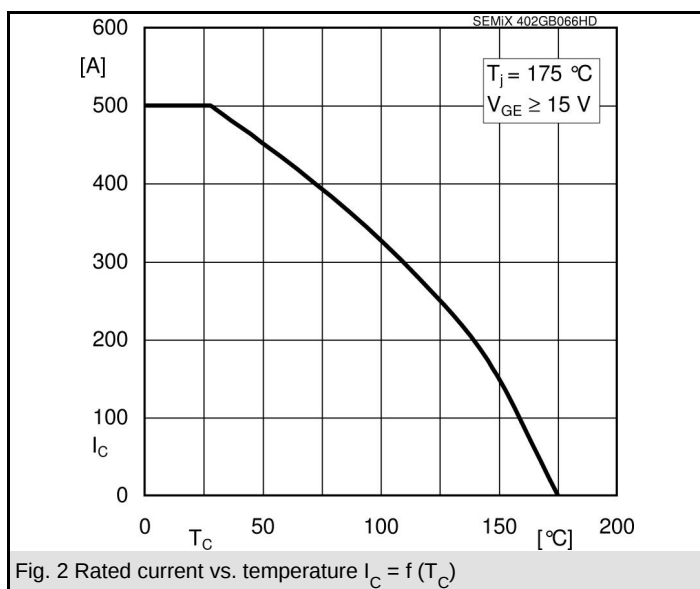
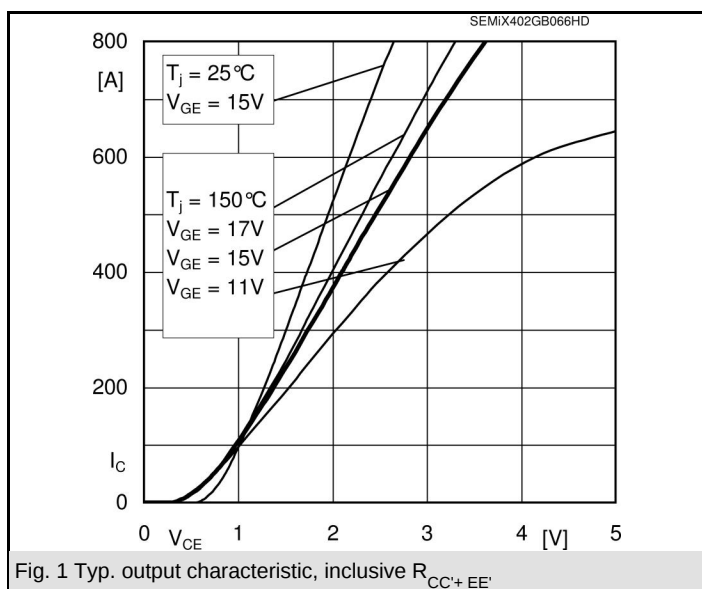
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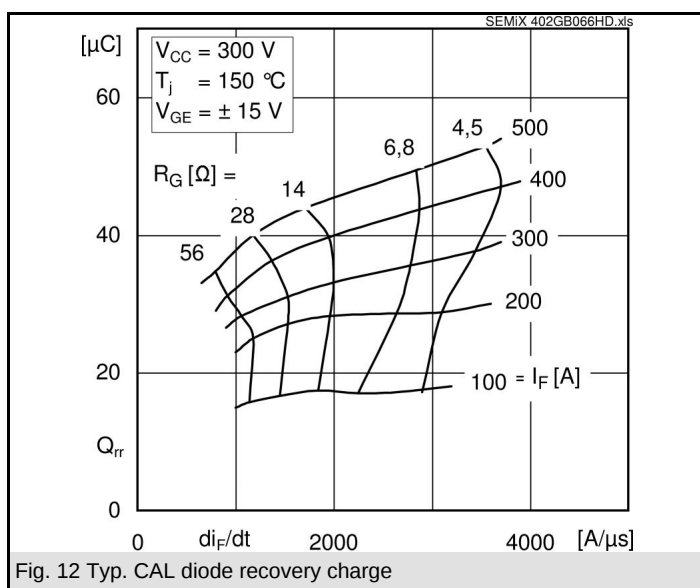
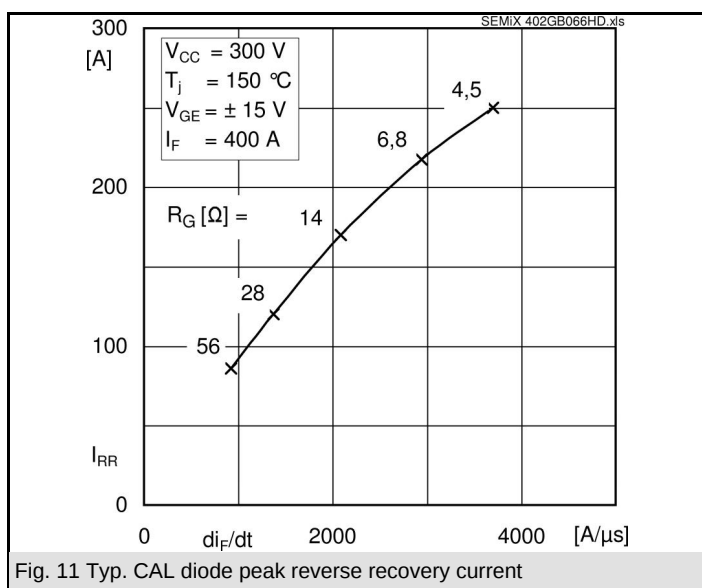
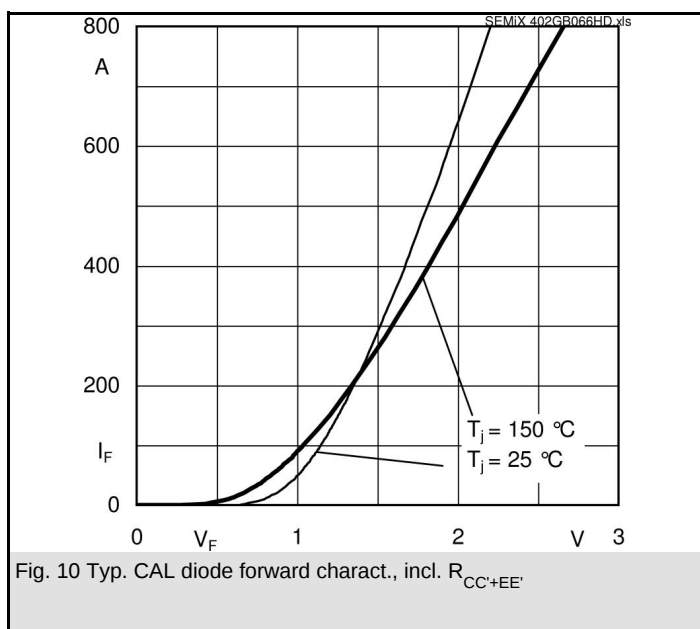
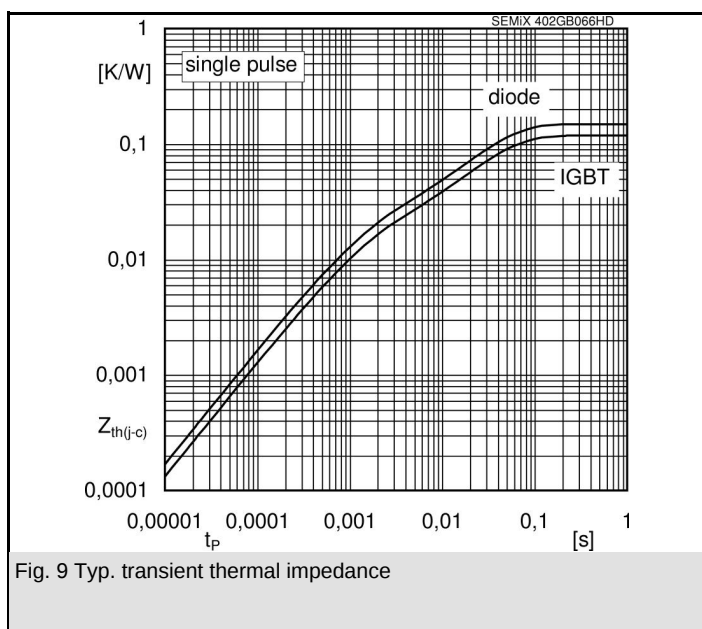
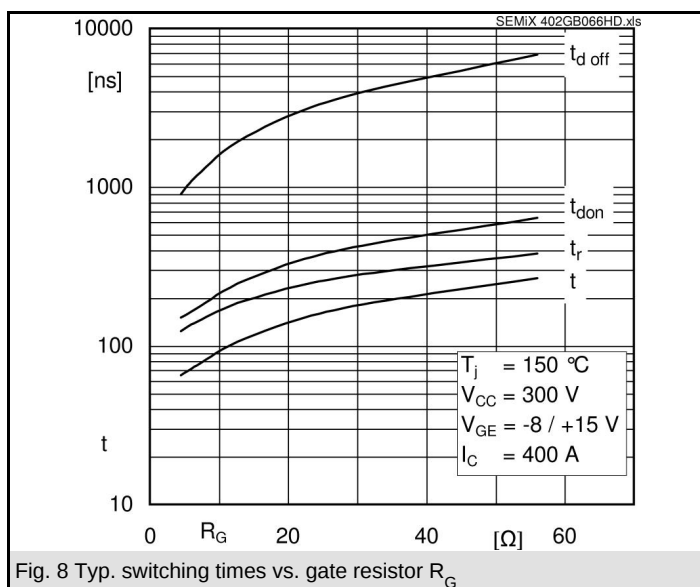
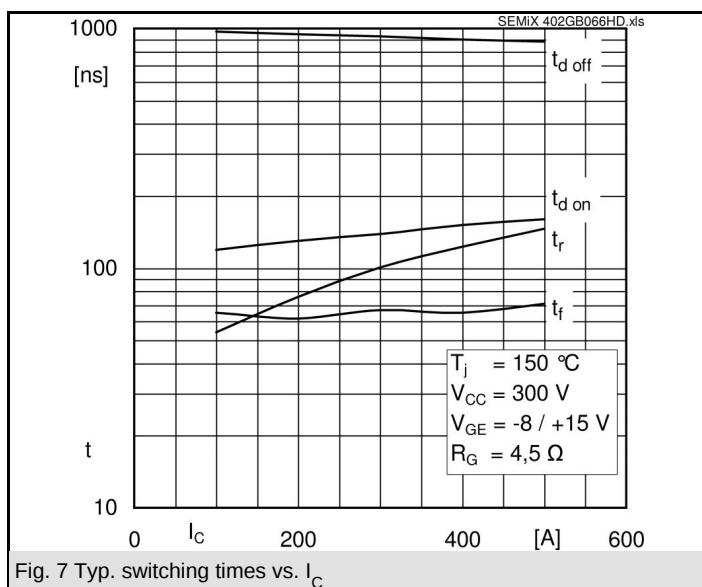
Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400\text{ A}; V_{GE} = 0\text{ V}$				
	$T_J = 25^\circ\text{C}_{chiplev.}$		1,4	1,6	V
	$T_J = 150^\circ\text{C}_{chiplev.}$		1,4	1,6	V
V_{F0}	$T_J = 25^\circ\text{C}$		1	1,1	V
	$T_J = 150^\circ\text{C}$		0,85	0,95	V
r_F	$T_J = 25^\circ\text{C}$		1	1,25	mΩ
	$T_J = 150^\circ\text{C}$		1,4	1,65	mΩ
I_{RRM}	$I_{Fnom} = 400\text{ A}$		250		A
Q_{rr}	$di/dt = 3700\text{ A}/\mu\text{s}$		47		μC
E_{rr}	$V_{GE} = -8\text{ V}; V_{CC} = 300\text{ V}$		10		mJ
$R_{th(j-c)D}$	per diode			0,15	K/W
Module					
L_{CE}			18		nH
$R_{CC'+EE'}$	res., terminal-chip	$T_{case} = 25^\circ\text{C}$	0,7		mΩ
		$T_{case} = 125^\circ\text{C}$	1		mΩ
$R_{th(c-s)}$	per module		0,045		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				250	g
Temperature sensor					
R_{100}	$T_C = 100^\circ\text{C}$ ($R_{25}=5\text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T)=R_{100}\exp[B_{100/125}(1/T-1/T_{100})]$; $T[\text{K}]; B$		3550±2%		K

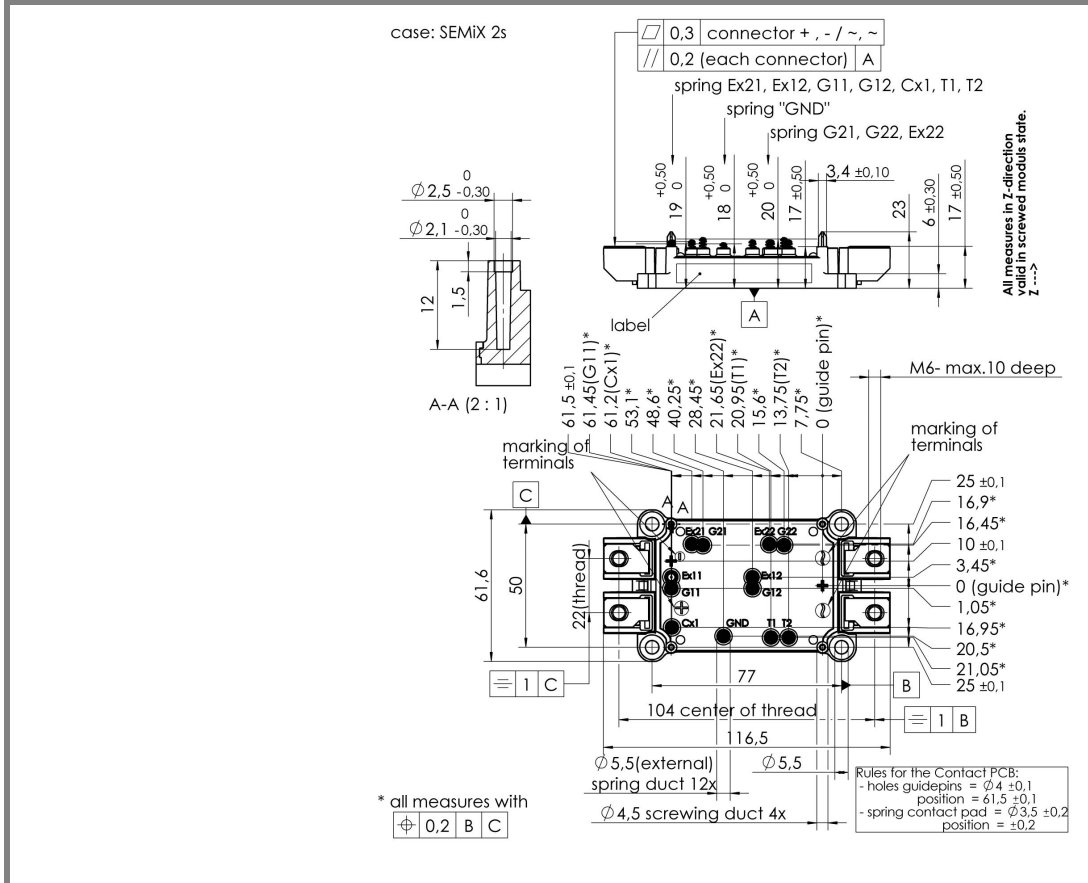
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

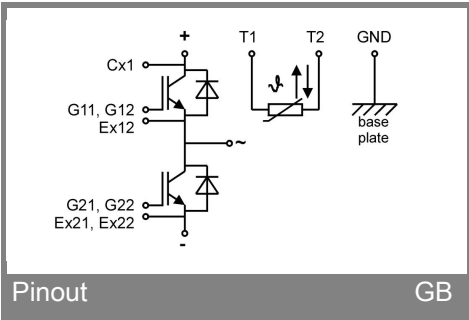




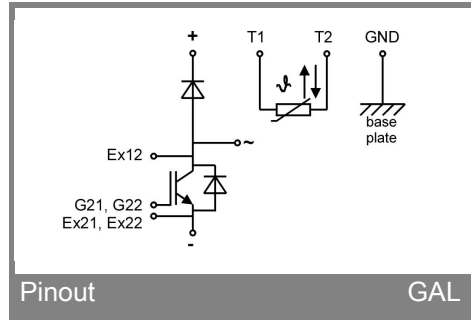




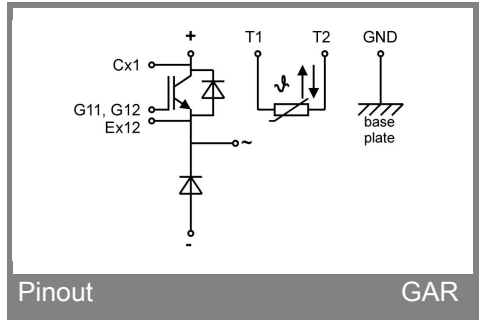
Case SEMiX 2s



GB



GAL



GAR