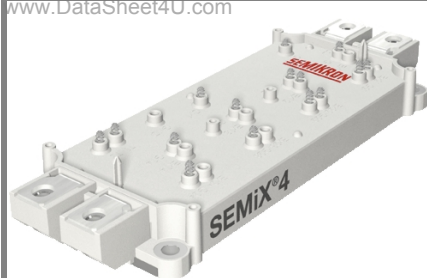


SEMiX 604GB126HDs

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SEMiX® 4s

Trench IGBT Modules

SEMiX 604GB126HDs

Preliminary Data

Features

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

Typical Applications

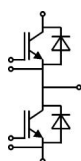
- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperature limited to $T_C = 125^\circ\text{C}$ max.

Absolute Maximum Ratings		T _{case} = 25°C, unless otherwise specified		
Symbol	Conditions		Values	Units
IGBT				
V _{CES}	T _j = 25 °C		1200	V
I _C	T _j = 150 °C	T _c = 25 °C	595	A
		T _c = 80 °C	415	A
I _{CRM}	I _{CRM} =2xI _{Cnom}		800	A
V _{GES}			± 20	V
t _{psc}	V _{CC} = 600 V; V _{GE} ≤ 20 V; T _j = 125 °C V _{CES} < 1200 V		10	μs
Inverse Diode				
I _F	T _j = 150 °C	T _c = 25 °C	535	A
		T _c = 80 °C	370	A
I _{FRM}	I _{FRM} =2xI _{Fnom}		800	A
I _{FSM}	t _p = 10 ms; sin. T _j = 25 °C		2500	A
Module				
I _{t(RMS)}			600	A
T _{vj}			- 40 ... + 150	°C
T _{stg}			- 40 ... + 125	°C
V _{isol}	AC, 1 min.		4000	V

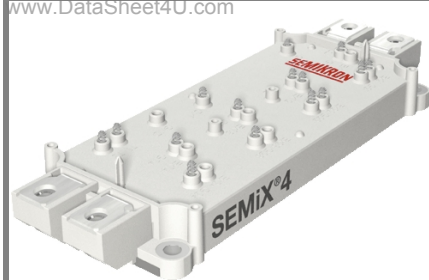
Characteristics			T _{case} = 25°C, unless otherwise specified			
Symbol	Conditions		min.	typ.	max.	Units
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 16 mA		5	5,8	6,5	V
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _J = 25 °C				0,3	mA
V _{CE0}	T _J = 25 °C			1	1,2	V
	T _J = 125 °C			0,9	1,1	V
r _{CE}	V _{GE} = 15 V	T _J = 25°C		1,8	2,4	mΩ
		T _J = 125°C		2,8	3,4	mΩ
V _{CE(sat)}	I _{Cnom} = 400 A, V _{GE} = 15 V	T _J = 25°C _{chiplev.}		1,7	2,15	V
		T _J = 125°C _{chiplev.}		2	2,45	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V	f = 1 MHz		28,8		nF
C _{oes}				1,51		nF
C _{res}				1,31		nF
Q _G	V _{GE} = -8 ... +15V			3200		nC
t _{d(on)}	R _{Gon} = 2,2 Ω	V _{CC} = 600V I _{Cnom} = 400A T _J = 125 °C		330		ns
t _r				70		ns
E _{on}			36		mJ	
t _{d(off)}	R _{Goff} = 2,2 Ω			630		ns
t _f				130		ns
E _{off}			60		mJ	
R _{th(j-c)}	per IGBT				0,065	K/W



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- AC inverter drives
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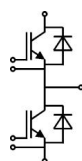
Remarks

- Case temperatur limited to $T_C=125^{\circ}\text{C}$ max.

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 400 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
	$T_j = 125^{\circ}\text{C}_{chiplev.}$		1,6	1,8	V
V_{F0}					
	$T_j = 25^{\circ}\text{C}$		1	1,1	V
	$T_j = 125^{\circ}\text{C}$		0,8	0,9	V
r_F					
	$T_j = 25^{\circ}\text{C}$		1,5	1,8	mΩ
	$T_j = 125^{\circ}\text{C}$		2	2,3	mΩ
I_{RRM}	$I_{Fnom} = 400 \text{ A}$		475		A
Q_{rr}	$di/dt = 6200 \text{ A}/\mu\text{s}$		100		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		46		mJ
$R_{th(j-c)D}$	per diode			0,11	K/W
Module					
L_{CE}			22		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		0,03		K/W
M_s	to heat sink (M5)	3		5	Nm
M_t	to terminals (M6)	2,5		5	Nm
w				400	g
Temperature sensor					
R_{100}	$T_c = 100^{\circ}\text{C}$ ($R_{25} = 5 \text{ k}\Omega$)		0,493±5%		kΩ
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125}(1/T - 1/T_{100})]$; $T[\text{K}]$		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.



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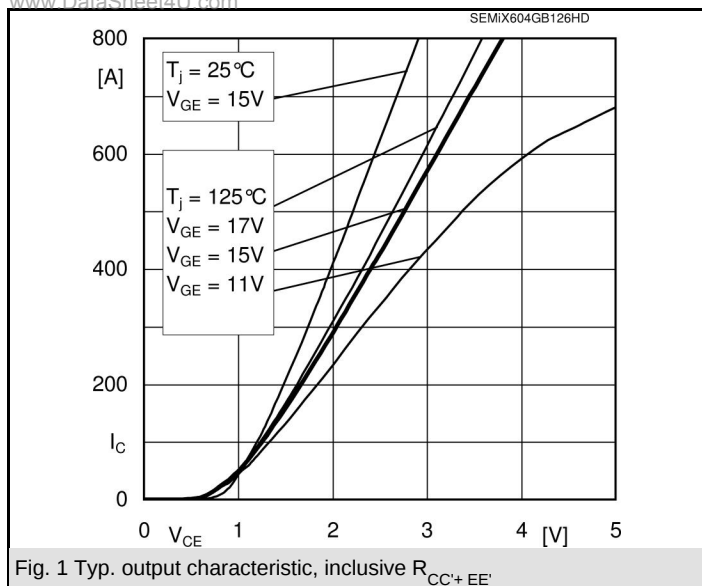


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

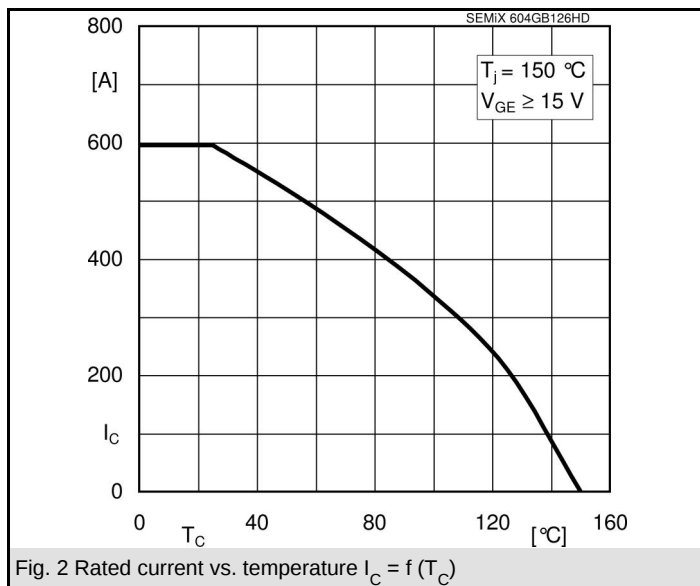


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

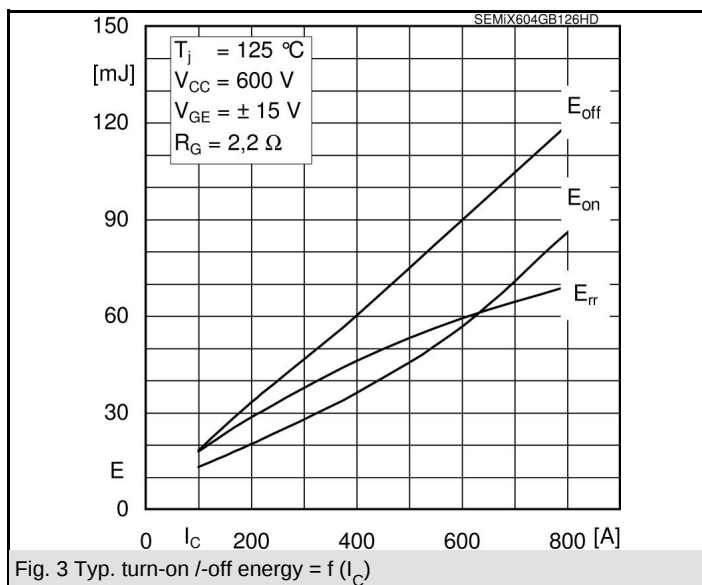


Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

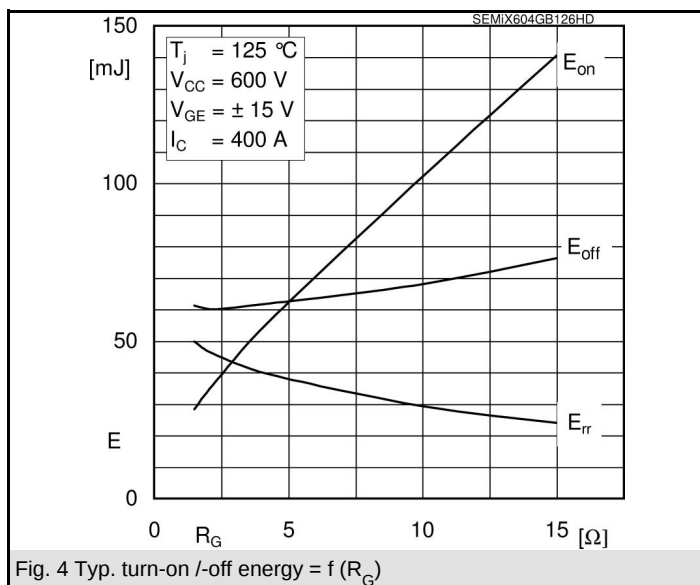


Fig. 4 Typ. turn-on /-off energy = $f(R_G)$

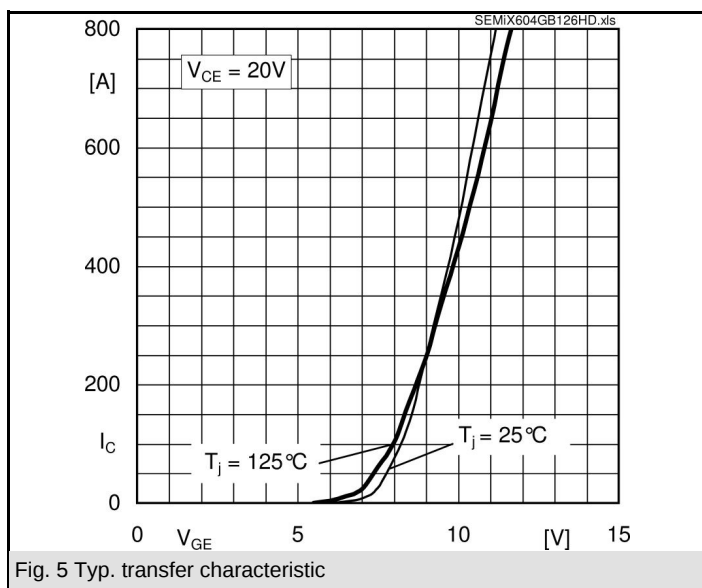


Fig. 5 Typ. transfer characteristic

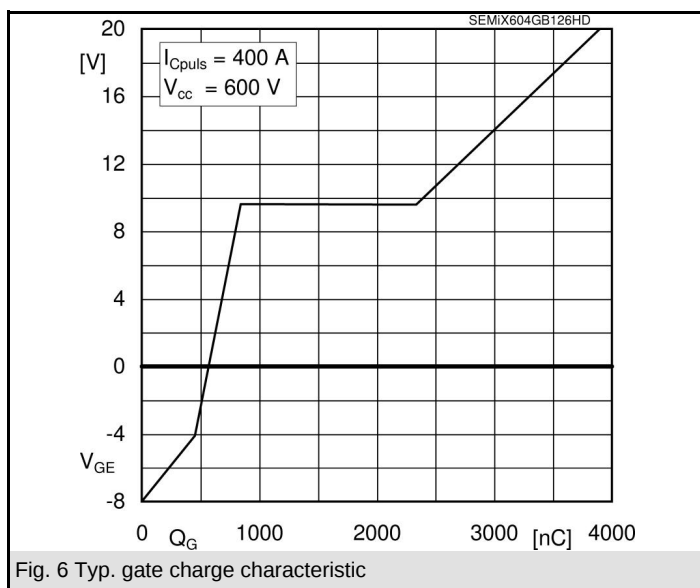
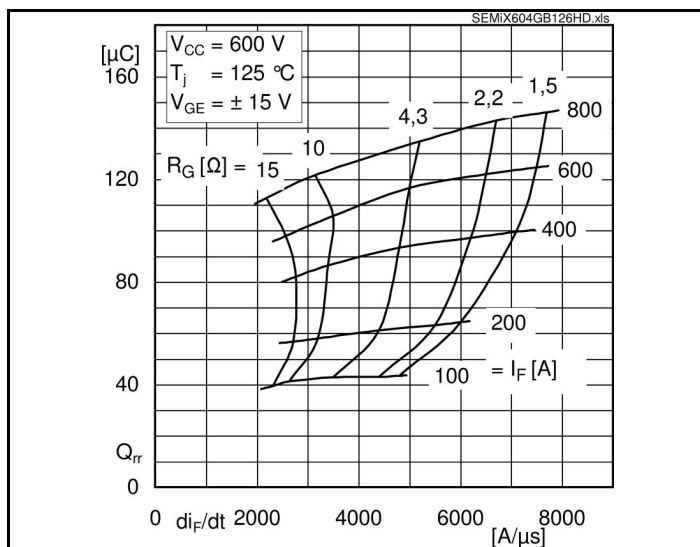
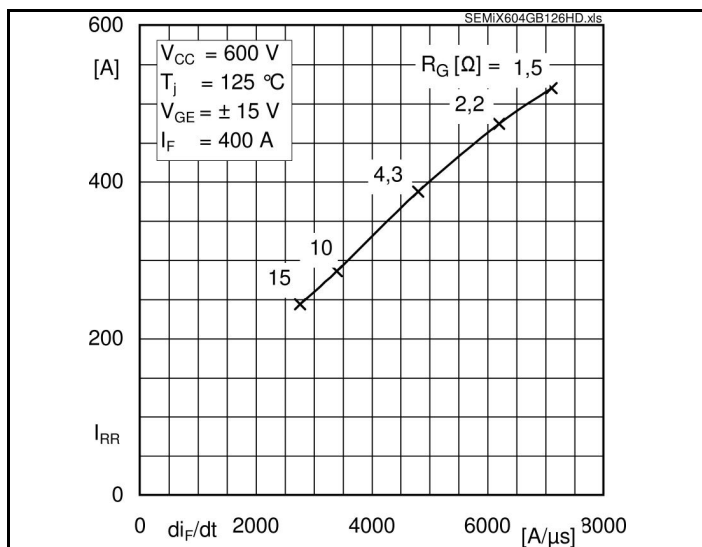
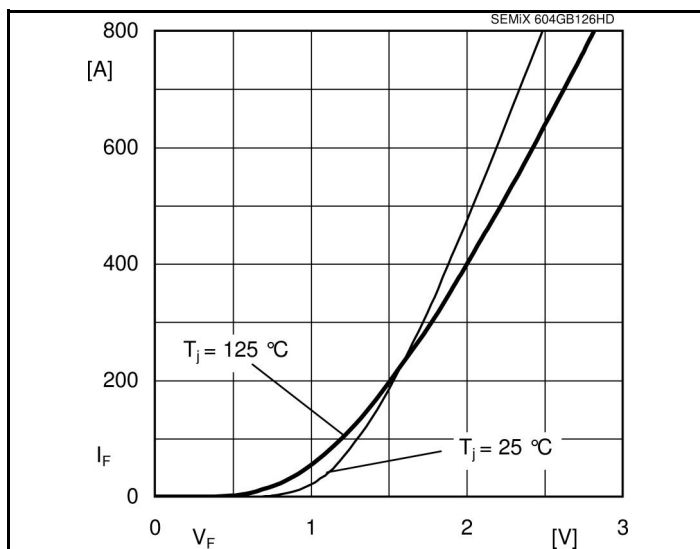
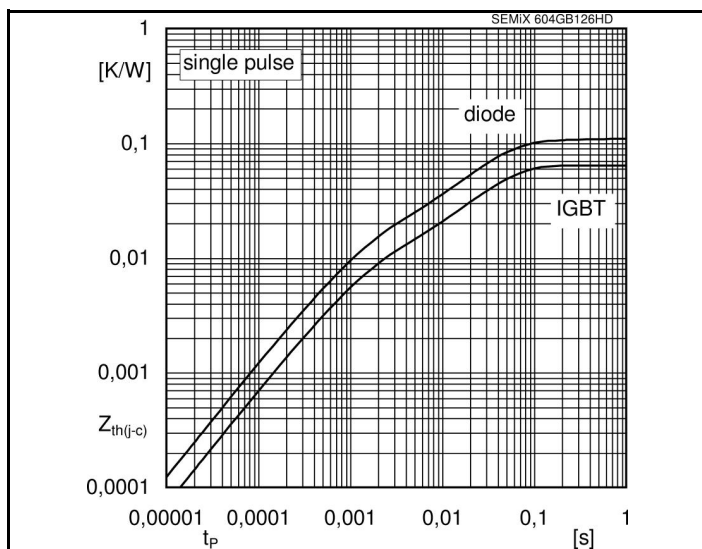
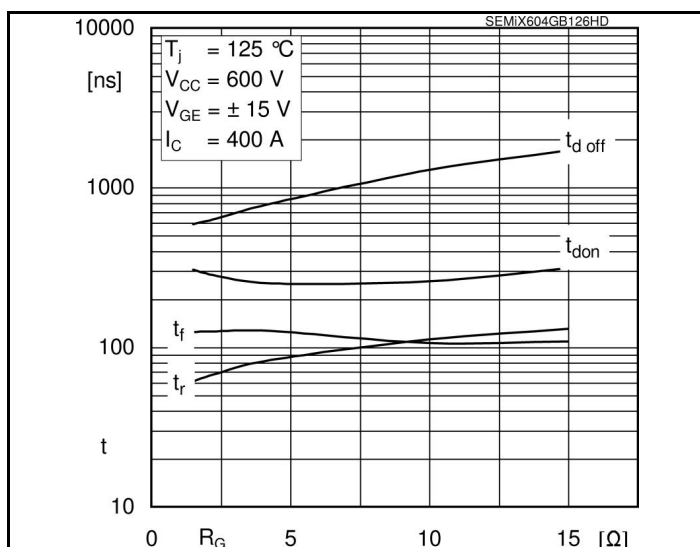
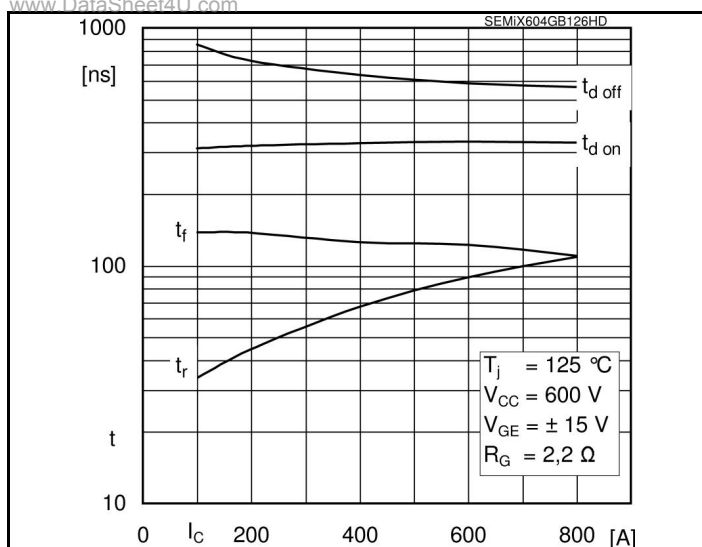


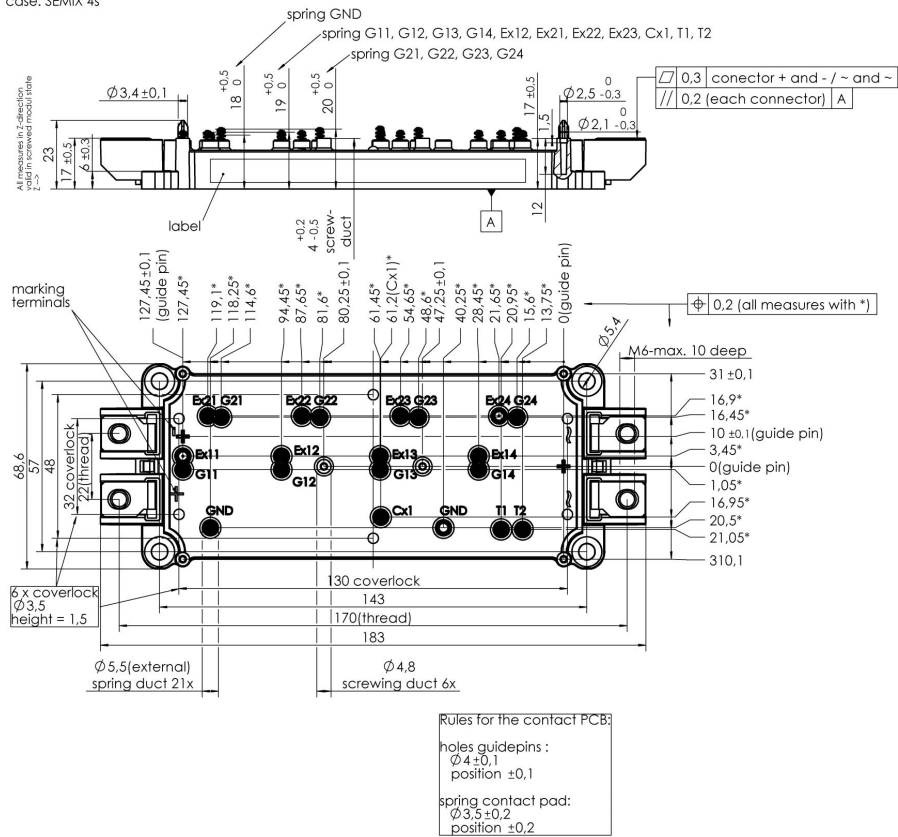
Fig. 6 Typ. gate charge characteristic



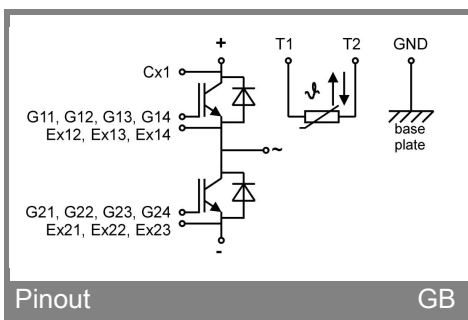
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Pinout

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