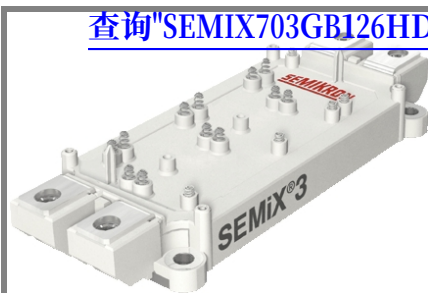


SEMiX 703GB126HDs

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SEMiX® 3s

Trench IGBT Modules

SEMiX 703GAL126HDs

SEMiX 703GAR126HDs

SEMiX 703GB126HDs

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

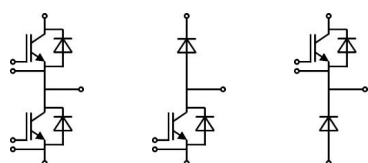
Remarks

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

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Absolute Maximum Ratings		$T_{\text{case}} = 25^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT			
V_{CES}	$T_j = 25^{\circ}\text{C}$	1200	V
I_{C}	$T_j = 150^{\circ}\text{C}$	$T_{\text{c}} = 25^{\circ}\text{C}$	A
		$T_{\text{c}} = 80^{\circ}\text{C}$	A
I_{CRM}	$I_{\text{CRM}}=2\times I_{\text{Cnom}}$	900	A
V_{GES}		± 20	V
t_{psc}	$V_{\text{CC}} = 600\text{ V}; V_{\text{GE}} \leq 20\text{ V}; T_j = 125^{\circ}\text{C}$ $V_{\text{CES}} < 1200\text{ V}$	10	μs
Inverse Diode			
I_{F}	$T_j = 150^{\circ}\text{C}$	$T_{\text{c}} = 25^{\circ}\text{C}$	A
		$T_{\text{c}} = 80^{\circ}\text{C}$	A
I_{FRM}	$I_{\text{FRM}}=2\times I_{\text{Fnom}}$	900	A
I_{FSM}	$t_{\text{p}} = 10\text{ ms}; \sin.$	$T_j = 25^{\circ}\text{C}$	A
Module			
$I_{\text{t(RMS)}}$		600	A
T_{vj}		- 40 ... + 150	$^{\circ}\text{C}$
T_{stg}		- 40 ... + 125	$^{\circ}\text{C}$
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 = 18 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 T _j = 125 °C		1	1,2	V
			0,9	1,1	V
r _{CE}	V _{GE} = 15 V T _j = 25°C T _j = 125°C		1,6	2,1	mΩ
			2,4	3	mΩ
V _{CE(sat)}	I _{Cnom} = 450 A, V _{GE} = 15 V T _j = 25°C _{chiplev.} T _j = 125°C _{chiplev.}		1,7	2,15	V
			2	2,45	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz		32,3		nF
C _{oes}			1,69		nF
C _{res}			1,46		nF
Q _G	V _{GE} = -8 ... +15V		3600		nC
t _{d(on)}	R _{Gon} = 1,6 Ω	V _{CC} = 600V I _{Cnom} = 450A T _j = 125 °C		310	ns
t _r				60	ns
E _{on}			32	mJ	
t _{d(off)}	R _{Goff} = 1,6 Ω			680	ns
t _f				135	ns
E _{off}			68	mJ	
R _{th(j-c)}	per IGBT			0,061	K/W



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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

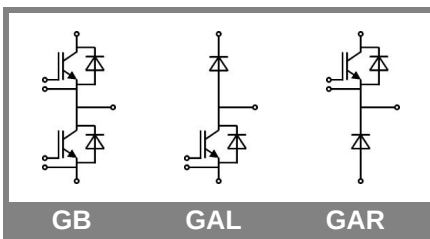
Remarks

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

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
Inverse Diode					
$V_F = V_{EC}$	$I_{Fnom} = 450 \text{ A}; V_{GE} = 0 \text{ V}$				
	$T_j = 25^\circ\text{C}_{chiplev.}$		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	$T_j = 25^\circ\text{C}$		1,3	1,6	mΩ
	$T_j = 125^\circ\text{C}$		1,8	2	mΩ
I_{RRM}	$I_{Fnom} = 450 \text{ A}$		580		A
Q_{rr}	$di/dt = 8500 \text{ A}/\mu\text{s}$		130		μC
E_{rr}	$V_{GE} = -15 \text{ V}; V_{CC} = 600 \text{ V}$		60		mJ
$R_{th(j-c)D}$	per diode			0,11	K/W
Module					
L_{CE}			20		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		0,04		K/W
M_s	to heat sink (M5)		3	5	Nm
M_t	to terminals (M6)		2,5	5	Nm
w				300	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.



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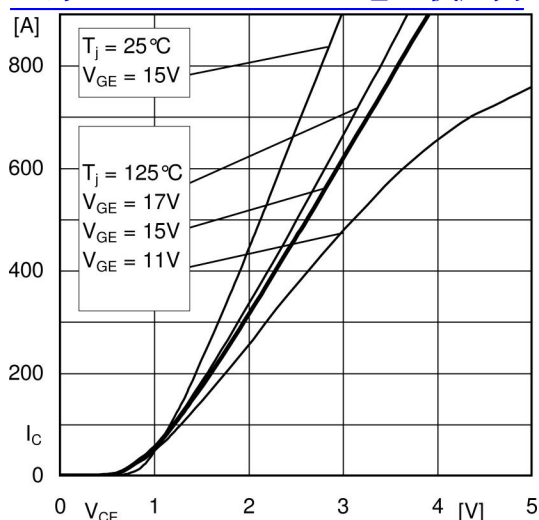


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

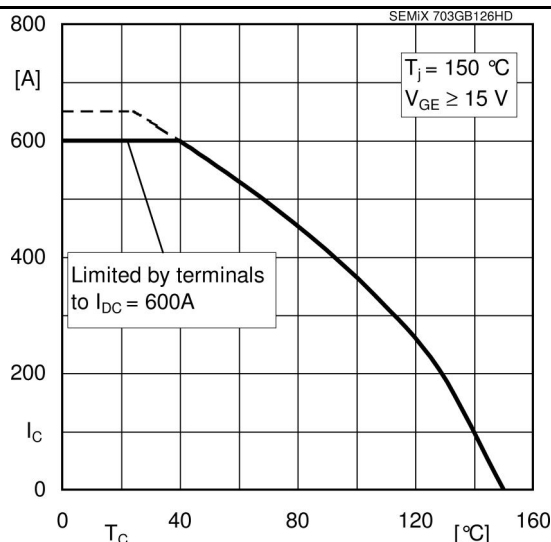


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

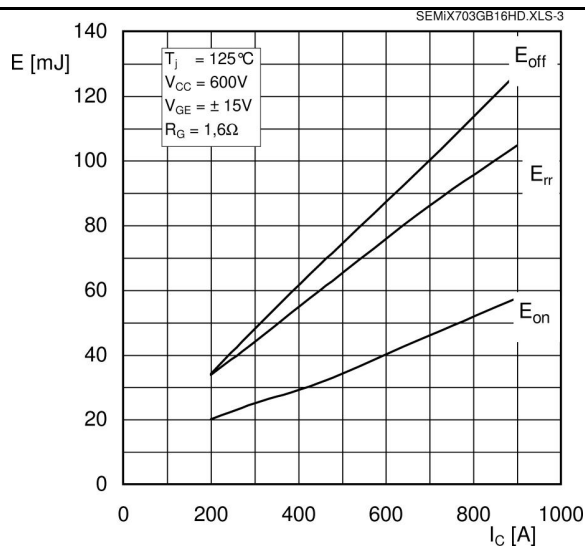


Fig. 3 Typ. turn-on /off energy = $f(I_C)$

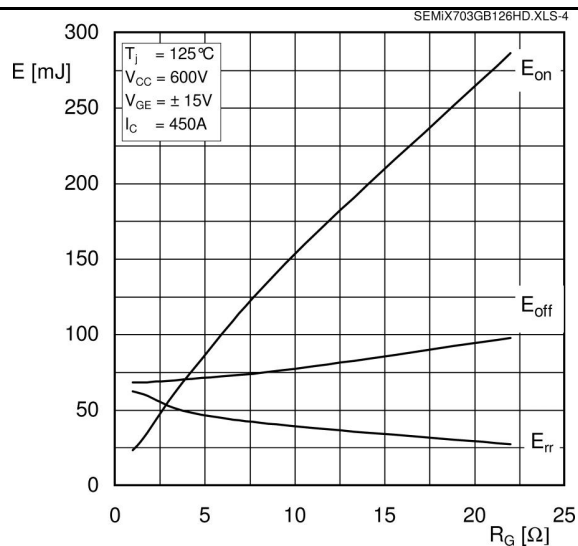


Fig. 4 Typ. turn-on /off energy = $f(R_G)$

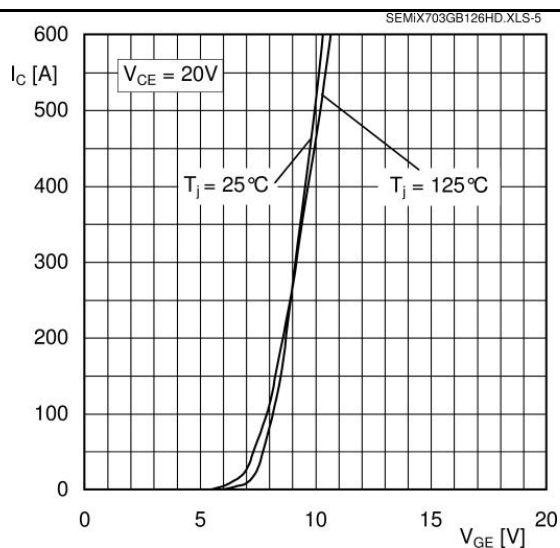


Fig. 5 Typ. transfer characteristic

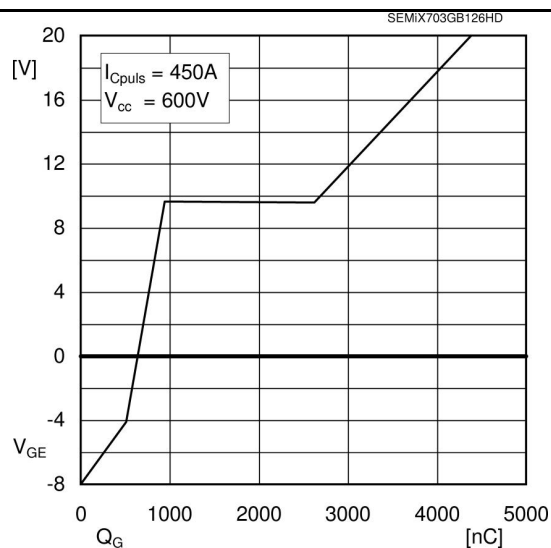
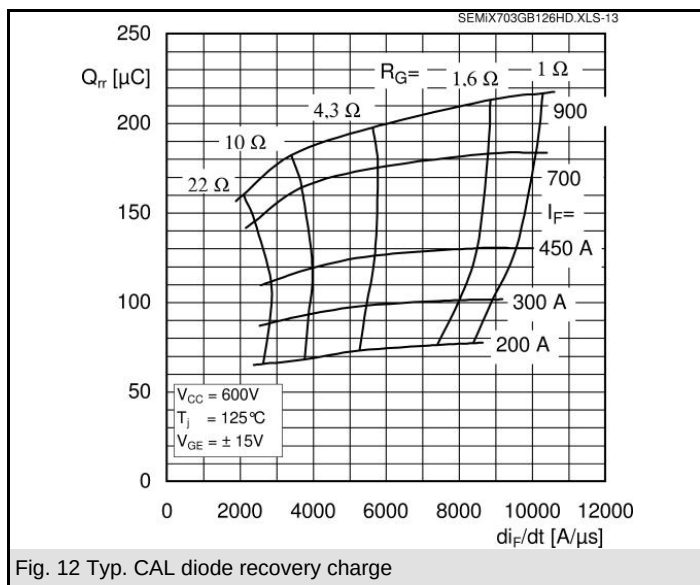
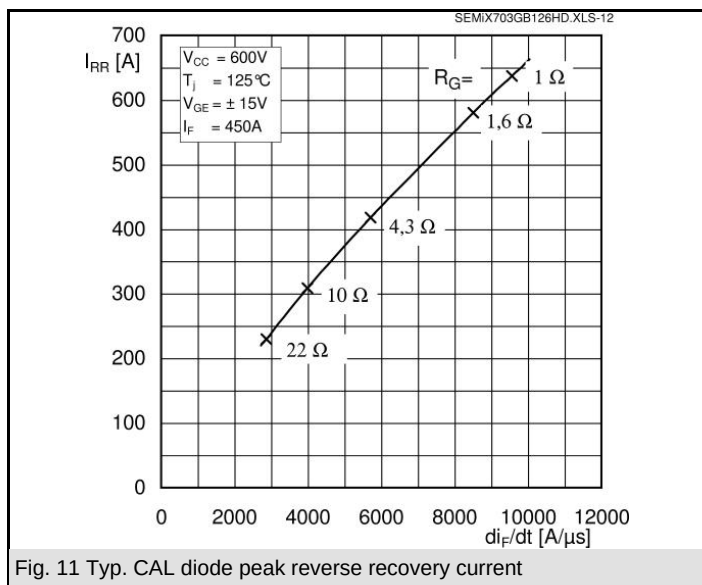
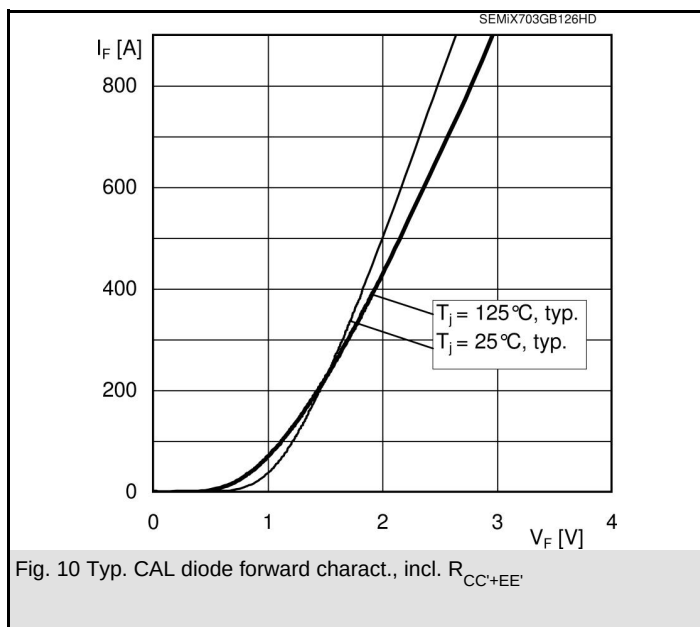
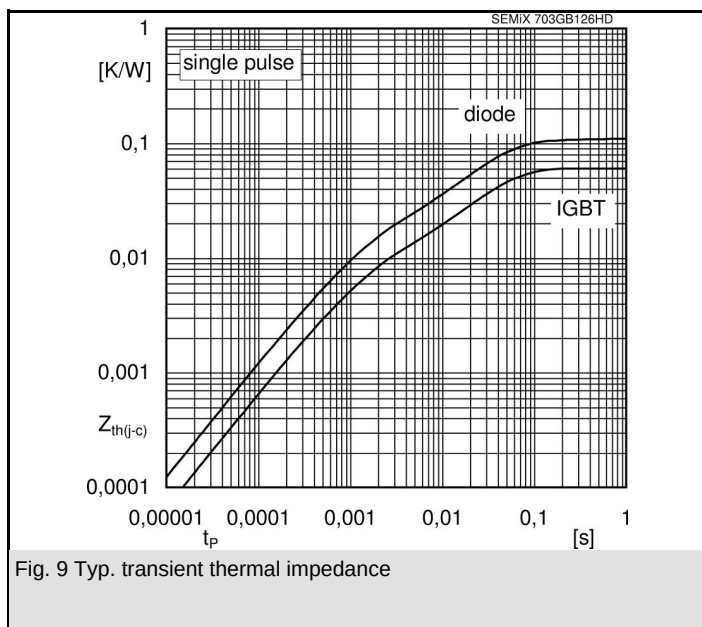
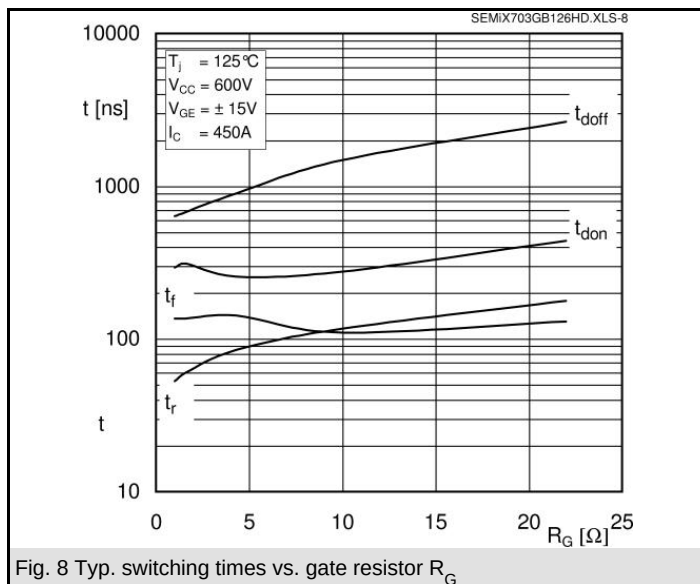
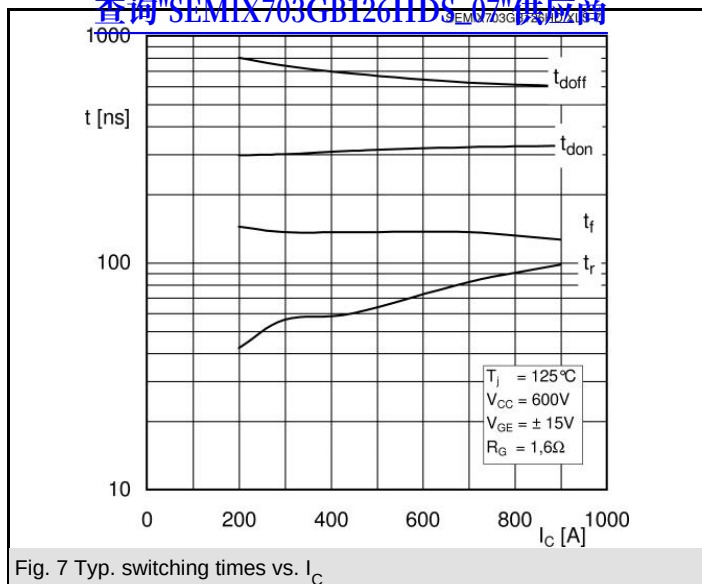
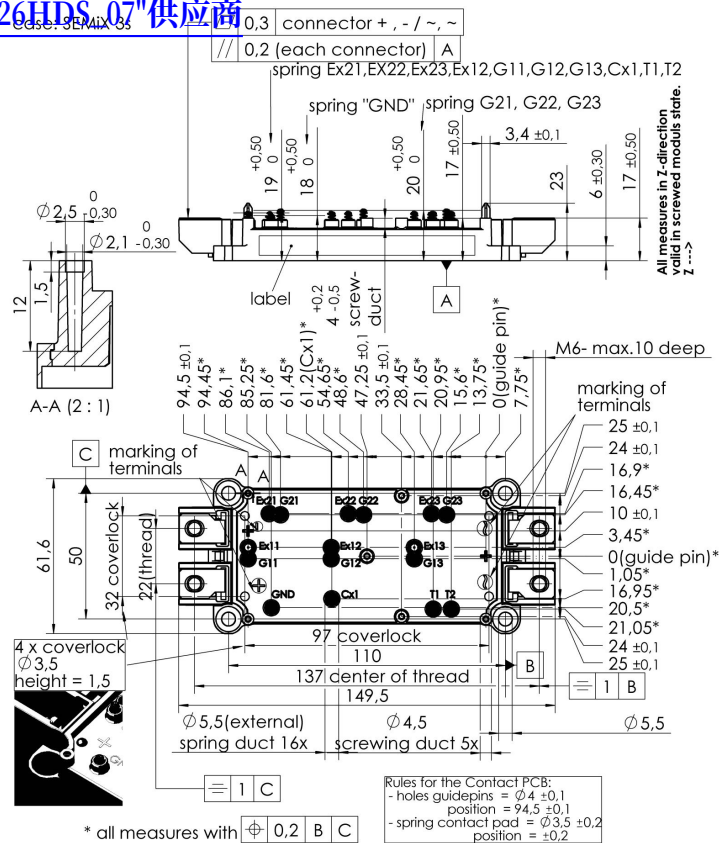


Fig. 6 Typ. gate charge characteristic

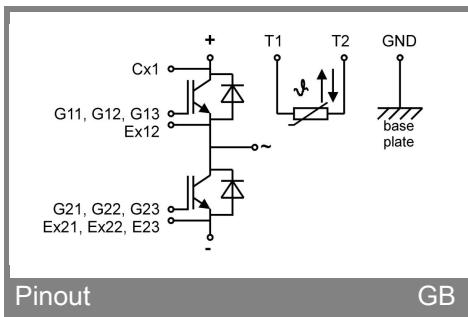
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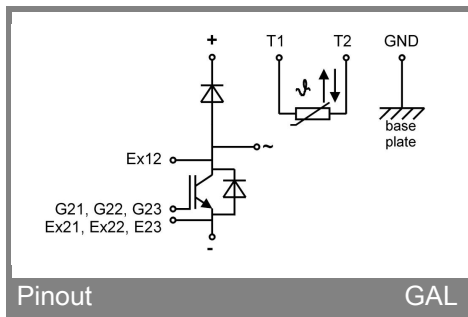


Case SEMiX 3s



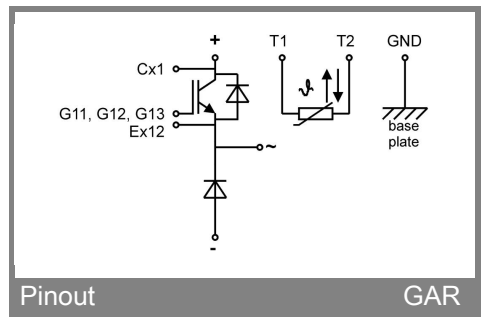
Pinout

GB



Pinout

GAL



Pinout

GAR