

# SKM 100GB063D



SEMITRANS® 2

## Superfast NPT-IGBT Module

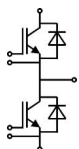
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### Features

- N channel, homogeneous Silicon structure (NPT- Non punch through IGBT)
- Low tail current with low temperature dependence
- High short circuit capability, self limiting if term. G is clamped to E
- Pos. temp.-coeff. of  $V_{CEsat}$
- Very low  $C_{ies}$ ,  $C_{oes}$ ,  $C_{res}$
- Latch-up free
- Fast & soft inverse CAL diodes
- Isolated copper Bonding Technology without hard mould
- Large clearance (10 mm) and creepage distances (20 mm)

### Typical Applications

- Switching (not for linear use)
- Switched mode power supplies
- UPS
- Three phase inverters for servo / AC motor speed control
- Pulse frequencies also above 10 kHz



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	600		V
$I_C$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	130	A
		$T_{case} = 70^\circ\text{C}$	100	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	200		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 600\text{ V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	100	A
		$T_{case} = 80^\circ\text{C}$	75	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	200		A
$I_{FSM}$	$t_p = 10\text{ ms}; \text{sin.}$	$T_j = 150^\circ\text{C}$	720	A
<b>Module</b>				
$I_{t(RMS)}$		200		A
$T_{vj}$		- 40 ... + 150		$^\circ\text{C}$
$T_{stg}$		- 40 ... + 125		$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500		V

Characteristics		$T_c = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT</b>					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 2\text{ mA}$	4,5	5,5	6,5	V
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,1	0,3	mA
$V_{CE0}$		$T_j = 25^\circ\text{C}$	1,05		V
		$T_j = 125^\circ\text{C}$	1		V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	10,5		m $\Omega$
		$T_j = 125^\circ\text{C}$	14		m $\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	2,1	2,5	V
		$T_j = 125^\circ\text{C}_{chiplev.}$	2,4	2,8	V
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	5,6		nF
$C_{oes}$			0,6		nF
$C_{res}$			0,4		nF
$Q_G$	$V_{GE} = 0\text{ V} - +15\text{ V}$	240		nC	
$R_{Gint}$	$T_j = ^\circ\text{C}$	0		$\Omega$	
$t_{d(on)}$	$R_{Gon} = 10\ \Omega$	$V_{CC} = 300\text{ V}$ $I_{Cnom} = 100\text{ A}$	50		ns
$t_r$			40		ns
$E_{on}$			4		mJ
$t_{d(off)}$	$R_{Goff} = 10\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	300		ns
$t_f$			35		ns
$E_{off}$			3		mJ
$R_{th(j-c)}$	per IGBT	0,27		K/W	

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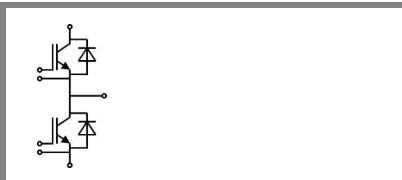
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### Characteristics

Symbol	Conditions	min.	typ.	max.	Units	
<b>Inverse Diode</b>						
$V_F = V_{EC}$	$I_{Fnom} = 100 \text{ A}; V_{GE} = 0 \text{ V}$		$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$	1,55	1,9	V
			$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$	1,55		V
$V_{F0}$			$T_j = 125 \text{ }^\circ\text{C}$	0,9	V	
$r_F$			$T_j = 125 \text{ }^\circ\text{C}$	8	10	m $\Omega$
$I_{RRM}$	$I_{Fnom} = 100 \text{ A}$		$T_j = 125 \text{ }^\circ\text{C}$	44		A
$Q_{rr}$				6		$\mu\text{C}$
$E_{rr}$				$V_{GE} = -15 \text{ V}; V_{CC} = 300 \text{ V}$		
$R_{th(j-c)D}$	per diode			0,6	K/W	
<b>Module</b>						
$L_{CE}$				30	nH	
$R_{CC+EE'}$	res., terminal-chip		$T_{case} = 25 \text{ }^\circ\text{C}$	0,75		m $\Omega$
			$T_{case} = 125 \text{ }^\circ\text{C}$	1		m $\Omega$
$R_{th(c-s)}$	per module			0,05	K/W	
$M_s$	to heat sink M6	3		5	Nm	
$M_t$	to terminals M5	2,5		5	Nm	
w				160	g	

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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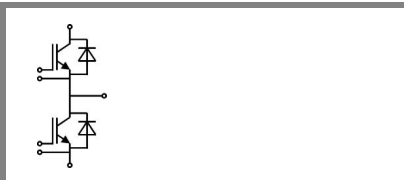
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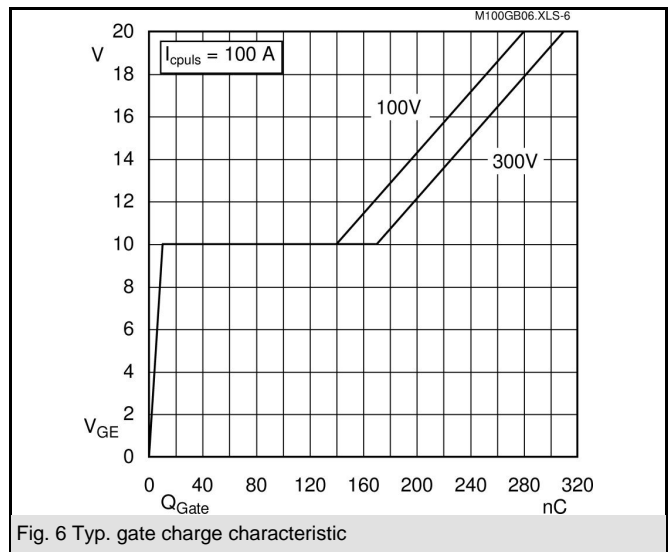
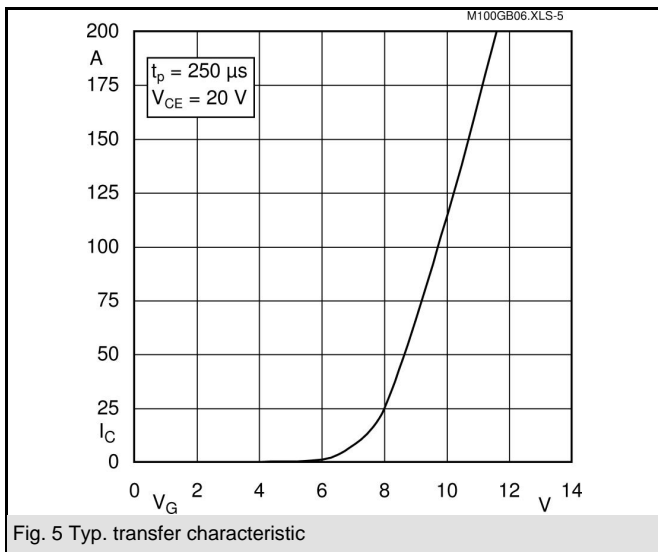
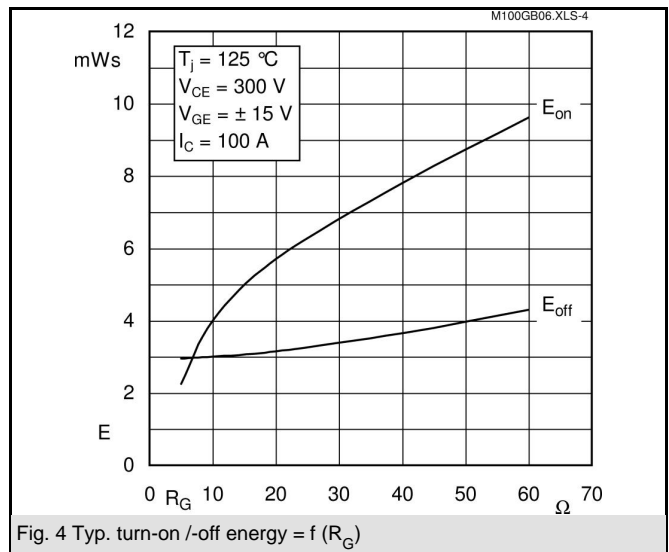
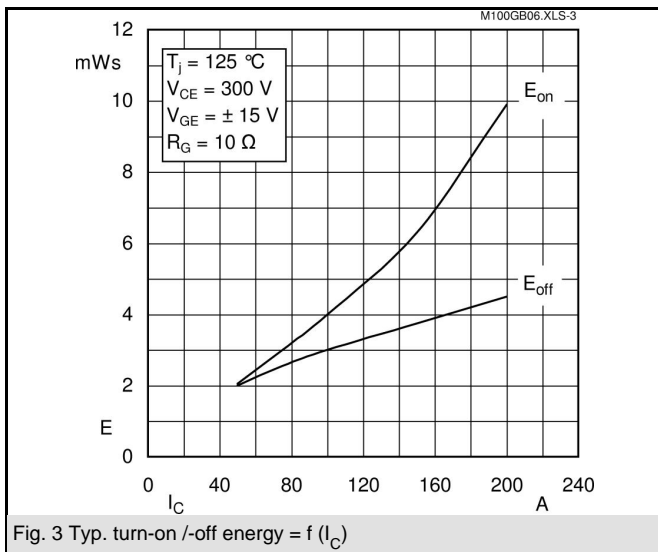
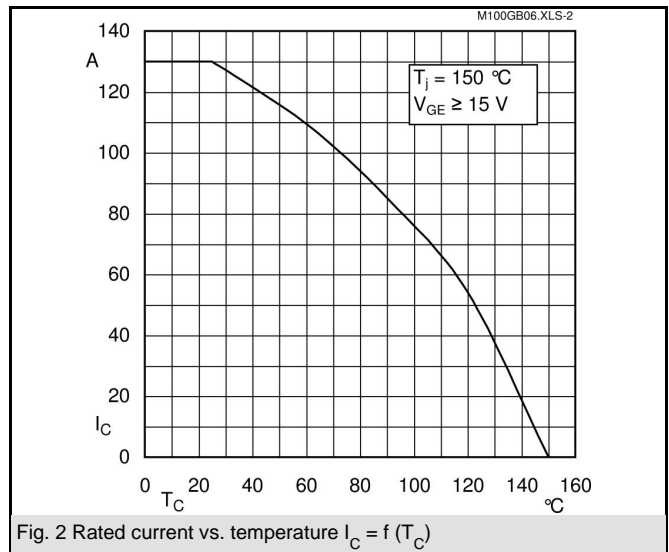
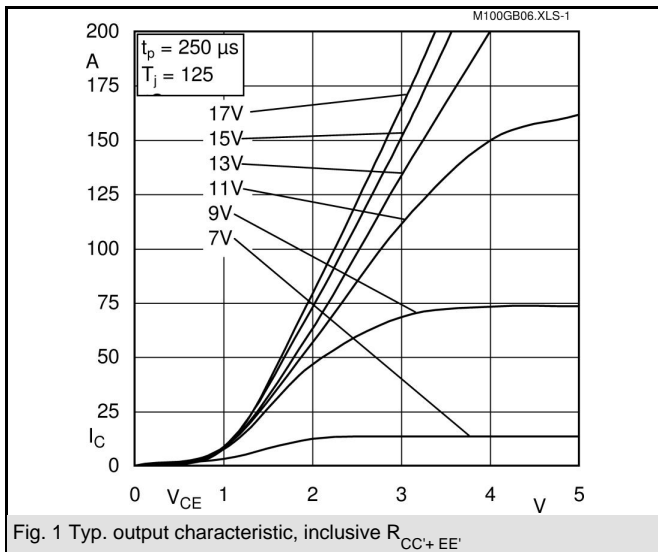
### Typical Applications

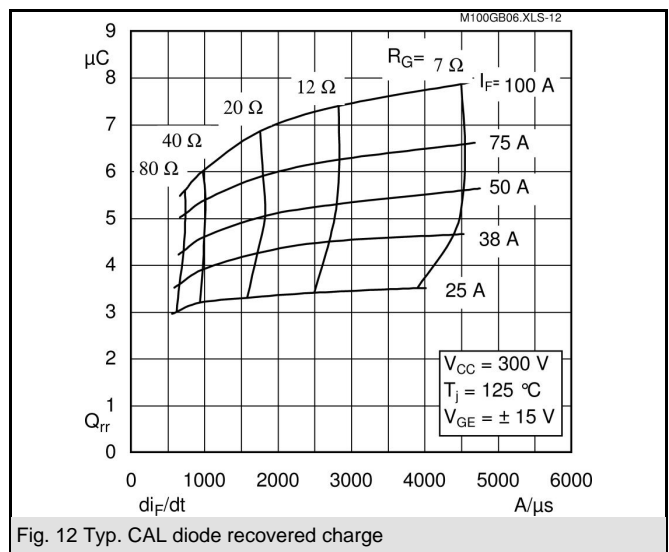
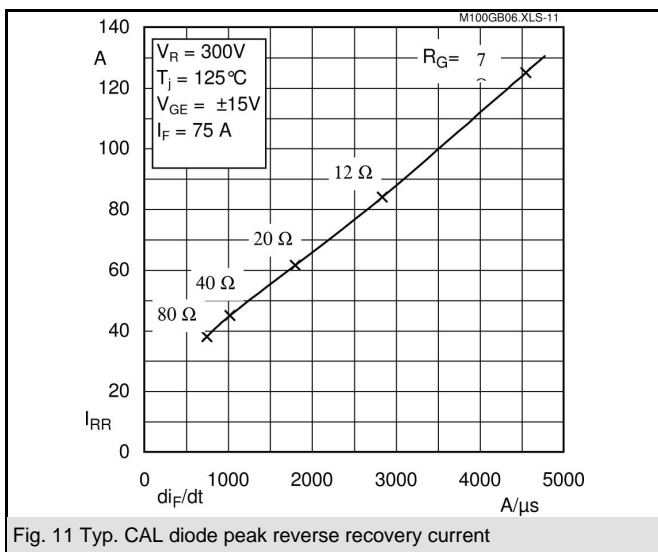
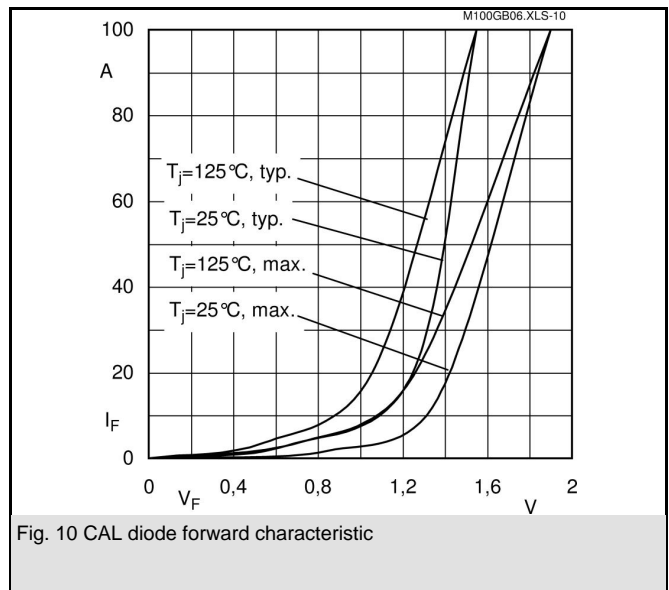
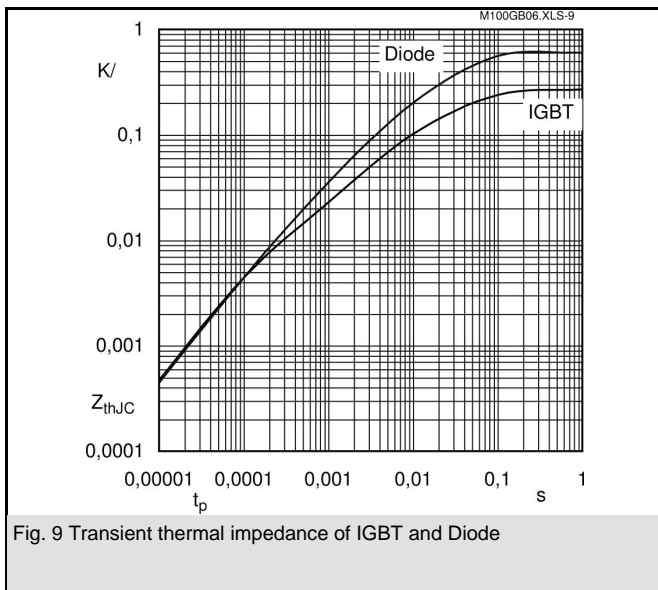
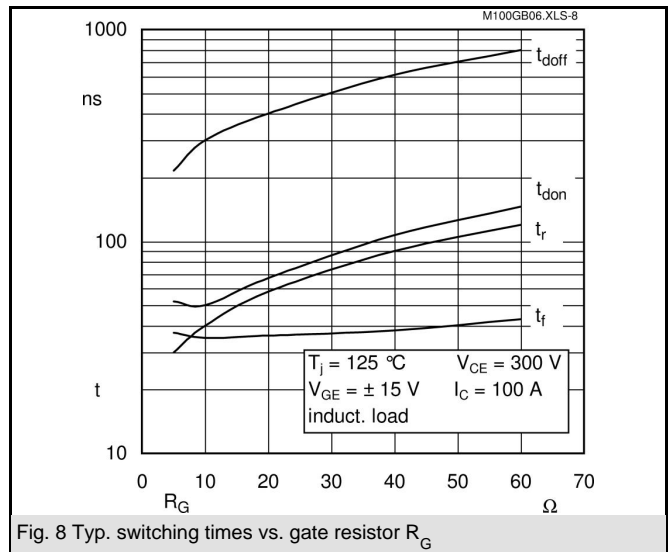
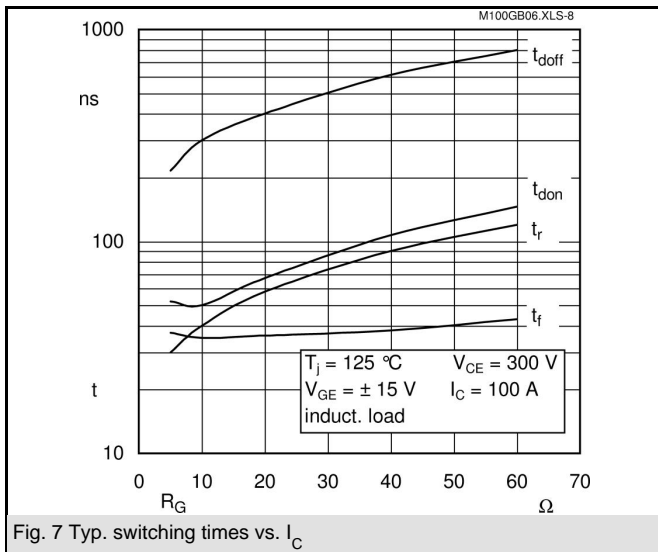
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$Z_{th}$		Values	Units
Symbol	Conditions		
$Z_{th(j-c)}$			
$R_i$	$i = 1$	160	mk/W
$R_i$	$i = 2$	88	mk/W
$R_i$	$i = 3$	18	mk/W
$R_i$	$i = 4$	4	mk/W
$\tau_{ai}$	$i = 1$	0,0447	s
$\tau_{ai}$	$i = 2$	0,0087	s
$\tau_{ai}$	$i = 3$	0,0015	s
$\tau_{ai}$	$i = 4$	0,0002	s
$Z_{th(j-c)D}$			
$R_i$	$i = 1$	400	mk/W
$R_i$	$i = 2$	165	mk/W
$R_i$	$i = 3$	30,5	mk/W
$R_i$	$i = 4$	4,5	mk/W
$\tau_{ai}$	$i = 1$	0,0613	s
$\tau_{ai}$	$i = 2$	0,0085	s
$\tau_{ai}$	$i = 3$	0,0045	s
$\tau_{ai}$	$i = 4$	0,0003	s



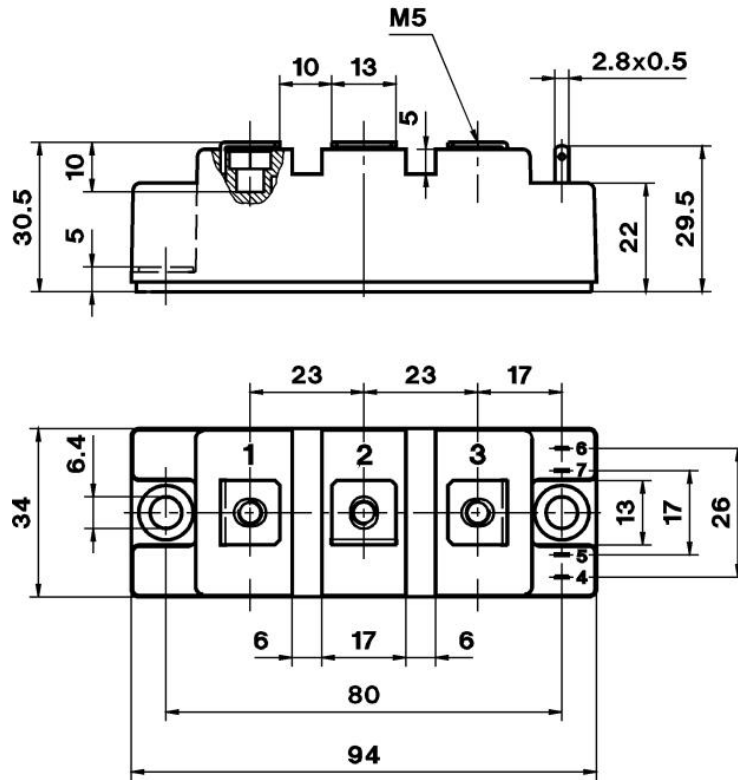


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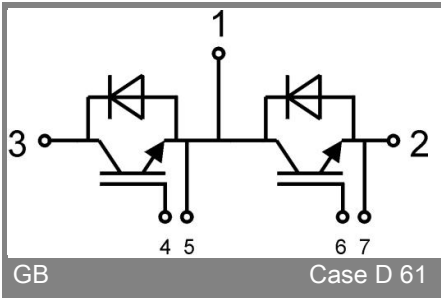
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