

# SKM 75GD123D



**SEMITRANS® 6**

## Standard IGBT Modules

SKM 75GD123DL

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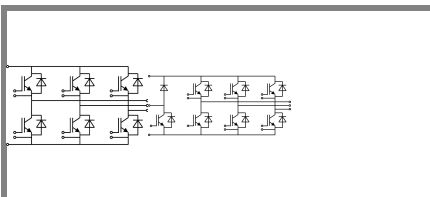
SKM 75GDL123D

## Features

- MOS input (voltage controlled)
- N channel, homogeneous Si
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to  $6 \times I_{Cnom}$
- Latch-up free
- Fast & soft inverse Cal diodes
- Isolated copper baseplate using DCB Direct Bonding Technology
- Large clearance (9 mm) and creepage distance (13 mm)

## Typical Applications

- Switched mode power supplies
- DC servo and robot drives
- Three phase inverters for AC motor speed control
- Switching (not for linear use)



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Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values		Units
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	1200		V
$I_C$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	75	A
		$T_{case} = 80^\circ\text{C}$	50	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	100		A
$V_{GES}$		$\pm 20$		V
$t_{psc}$	$V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10		$\mu\text{s}$
<b>Inverse Diode</b>				
$I_F$	$T_j = 150^\circ\text{C}$	$T_{case} = 25^\circ\text{C}$	75	A
		$T_{case} = 80^\circ\text{C}$	50	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	100		A
$I_{FSM}$	$t_p = 10\text{ ms}; \sin.$	$T_j = 150^\circ\text{C}$	550	A
<b>Module</b>				
$I_{t(RMS)}$		100		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
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$		0,4	1,2	mA
$V_{CE0}$		$T_j = 25^\circ\text{C}$	1,4	1,6	V
		$T_j = 125^\circ\text{C}$	1,6	1,8	V
$r_{CE}$	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	22	28	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$	30	38	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 50\text{ A}, V_{GE} = 15\text{ V}$	$T_j = ^\circ\text{C}_{chiplev.}$	2,5	3	V
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	3,3	4,3	nF
$C_{oes}$			0,5	0,6	nF
$C_{res}$			0,22	0,3	nF
$t_{d(on)}$	$R_{Gon} = 22\ \Omega$	$V_{CC} = 600\text{ V}$ $I_{Cnom} = 50\text{ A}$	44	100	ns
$t_r$			56	100	ns
$E_{on}$	$R_{Goff} = 22\ \Omega$	$T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	8		mJ
$t_{d(off)}$			380	500	ns
$t_f$			70	100	ns
$E_{off}$			5		mJ
$R_{th(j-c)}$	per IGBT			0,32	K/W

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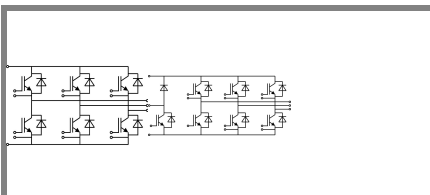
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Characteristics			min.	typ.	max.	Units
Symbol	Conditions					
<b>Inverse Diode</b>						
$V_F = V_{EC}$	$I_{Fnom} = 50 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25 \text{ }^\circ\text{C}_{chiplev.}$		2	2,5	V
		$T_j = 125 \text{ }^\circ\text{C}_{chiplev.}$		1,8		V
$V_{F0}$		$T_j = 25 \text{ }^\circ\text{C}$		1,1	1,2	V
		$T_j = 125 \text{ }^\circ\text{C}$				V
$r_F$		$T_j = 25 \text{ }^\circ\text{C}$		18	26	mΩ
		$T_j = 125 \text{ }^\circ\text{C}$				mΩ
$I_{RRM}$	$I_{Fnom} = 50 \text{ A}$	$T_j = 125 \text{ }^\circ\text{C}$		35		A
$Q_{rr}$	$di/dt = 800 \text{ A}/\mu\text{s}$			7		μC
$E_{rr}$	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$			2,2		mJ
$R_{th(j-c)D}$	per diode				0,6	K/W
<b>Module</b>						
$L_{CE}$					60	nH
$R_{th(c-s)}$	per module				0,05	K/W
$M_s$	to heat sink M5					Nm
$M_t$	to terminals		4		5	Nm
w					175	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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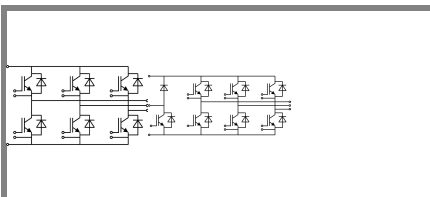
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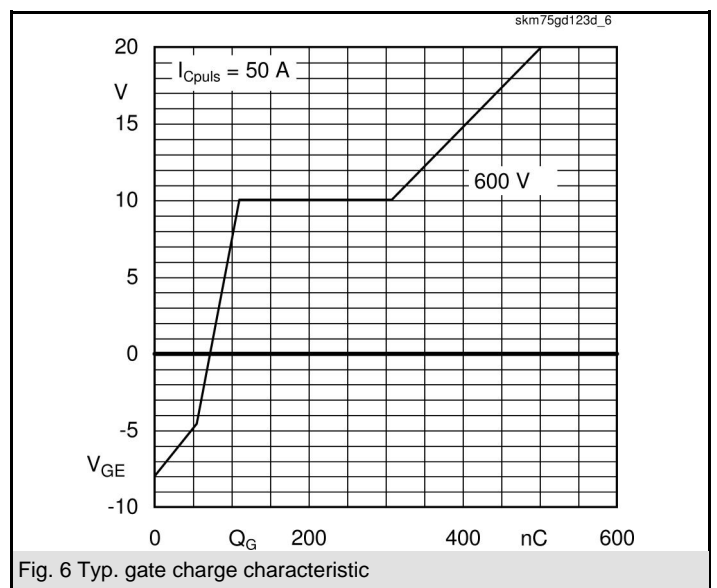
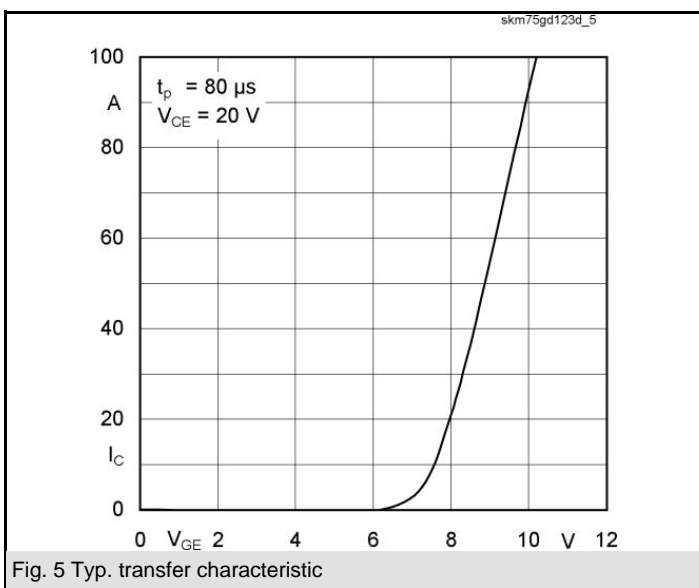
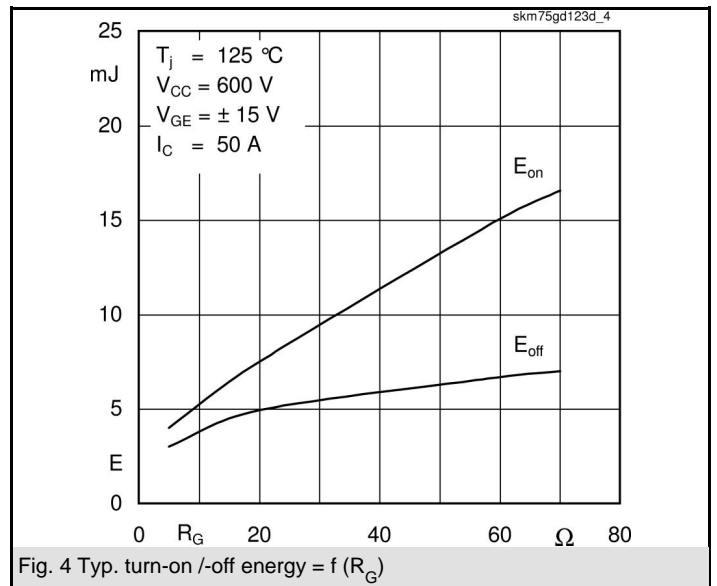
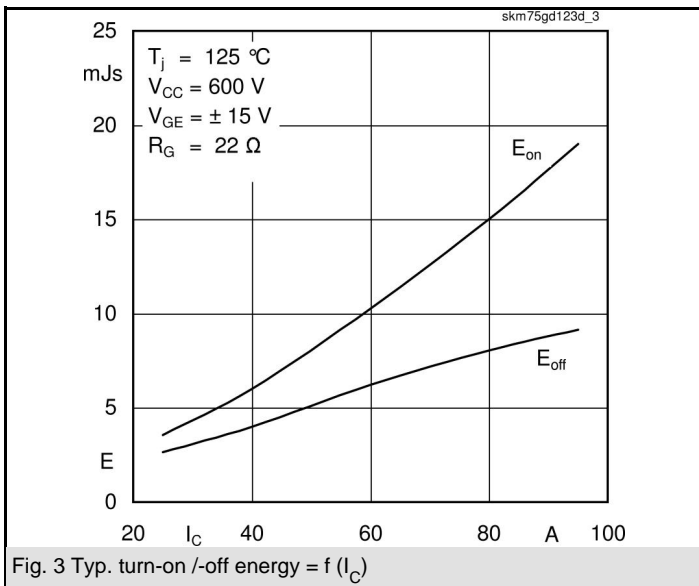
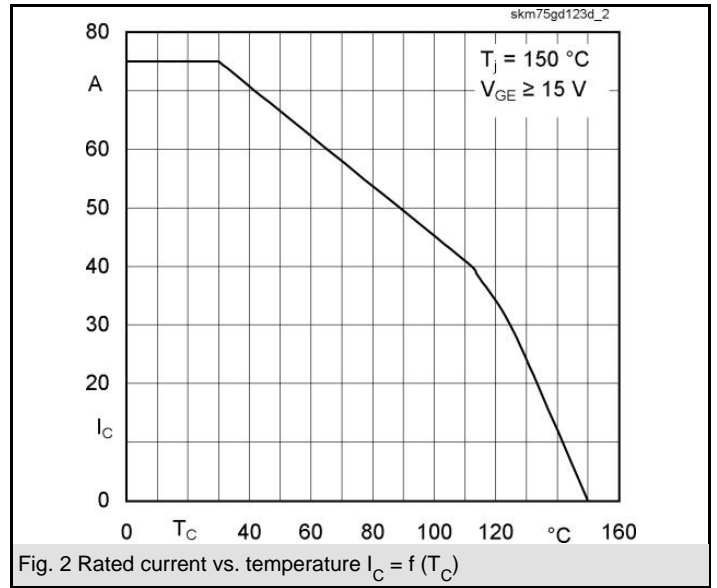
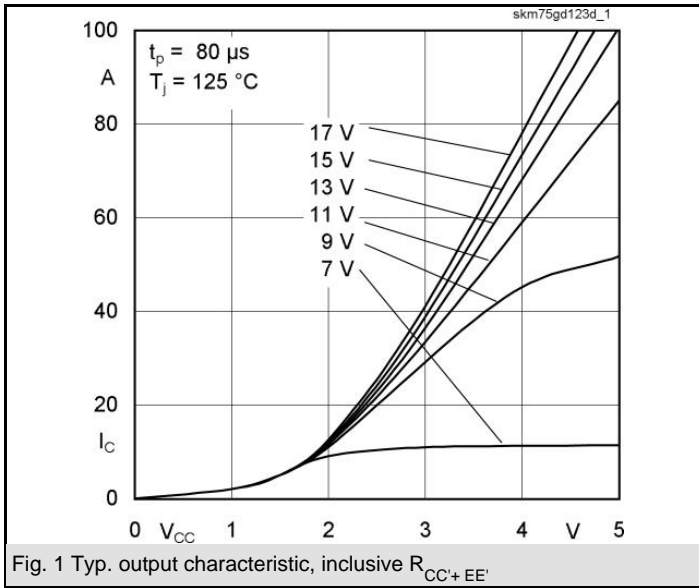
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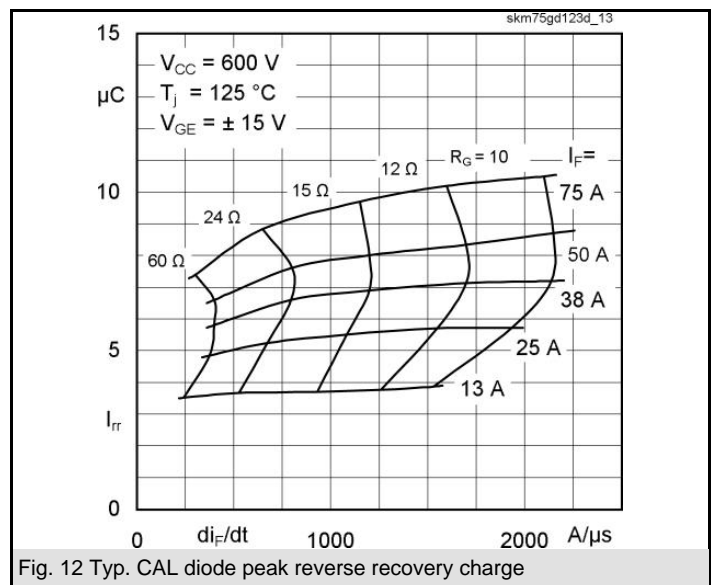
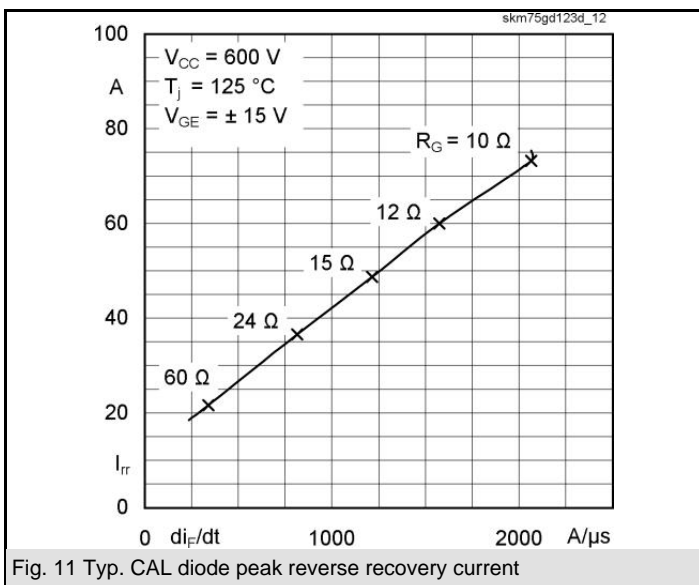
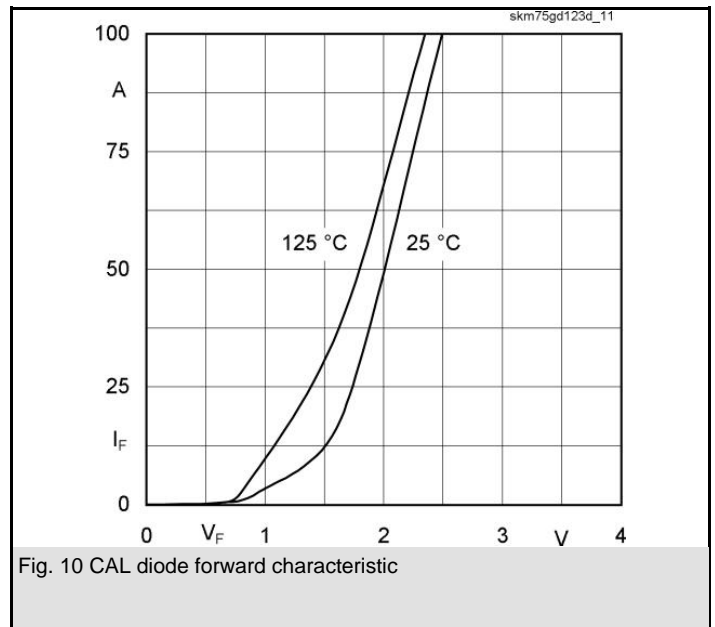
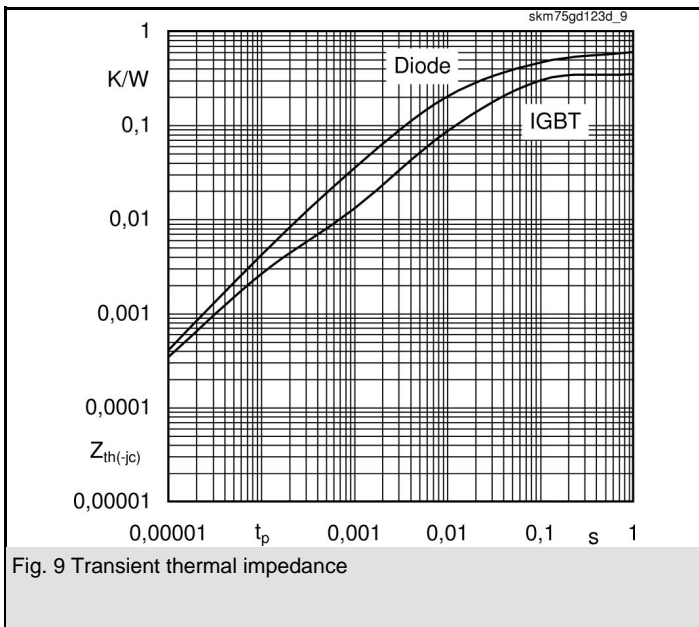
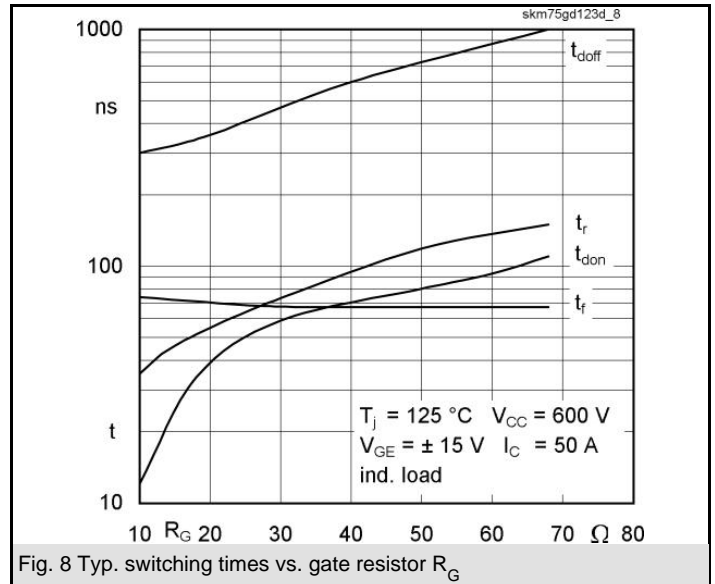
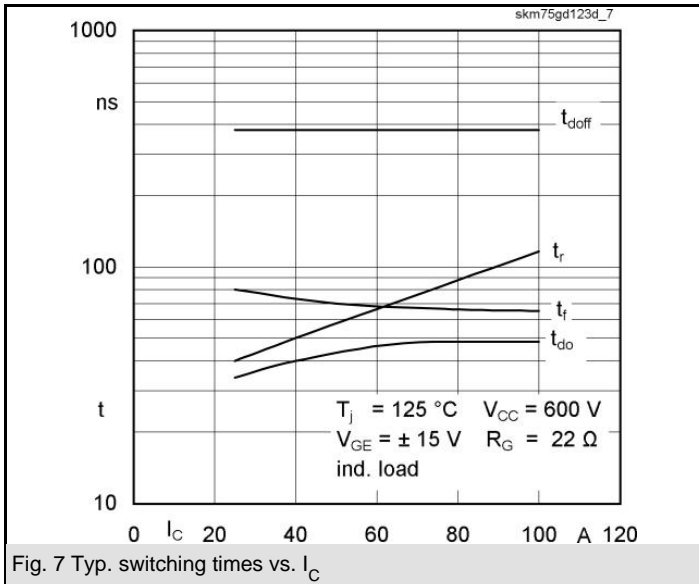


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$Z_{th}$		Conditions	Values	Units
<b>Symbol</b>				
$Z_{th(j-c)I}$				
$R_f$	$i = 1$		240	mk/W
$R_f$	$i = 2$		68	mk/W
$R_f$	$i = 3$		9,2	mk/W
$R_f$	$i = 4$		2,8	mk/W
$\tau_{u_i}$	$i = 1$		0,06	s
$\tau_{u_i}$	$i = 2$		0,0228	s
$\tau_{u_i}$	$i = 3$		0,0013	s
$\tau_{u_i}$	$i = 4$		0,0002	s
$Z_{th(j-c)D}$				
$R_f$	$i = 1$		400	mk/W
$R_f$	$i = 2$		168	mk/W
$R_f$	$i = 3$		28	mk/W
$R_f$	$i = 4$		4	mk/W
$\tau_{u_i}$	$i = 1$		0,0831	s
$\tau_{u_i}$	$i = 2$		0,0112	s
$\tau_{u_i}$	$i = 3$		0,0013	s
$\tau_{u_i}$	$i = 4$		0,08	s



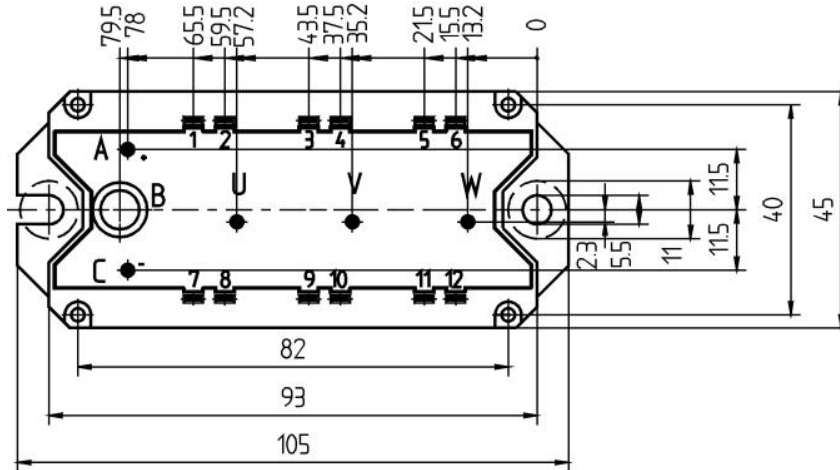
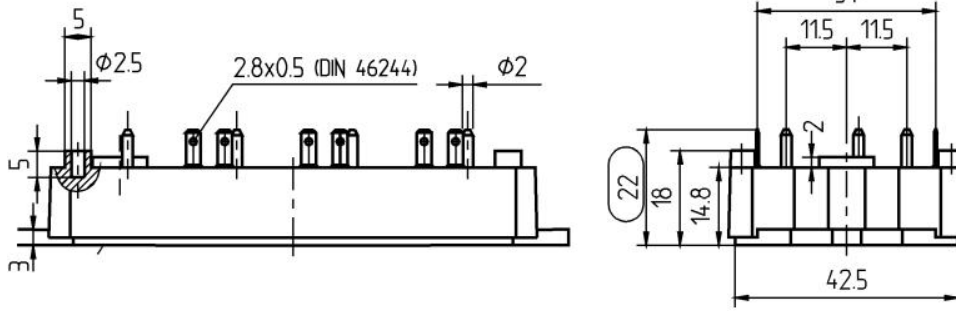


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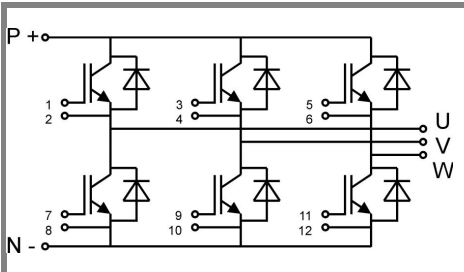
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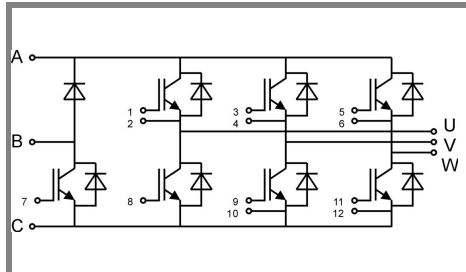


Case D 56a



Case D 67

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Case D 73

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