SKM 145GAL176D

SEMITRANS™ 2
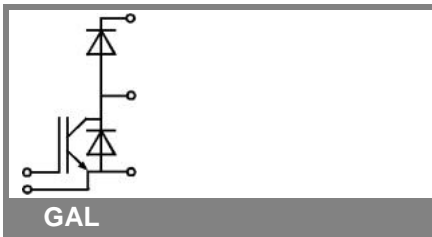
Trench IGBT Modules

SKM 145GAL176D

Target Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to 6 x I_C

Typical Applications

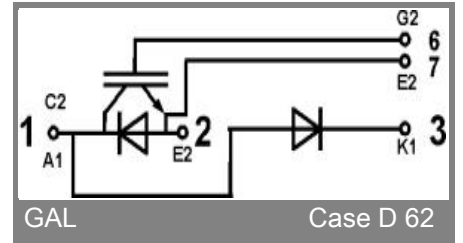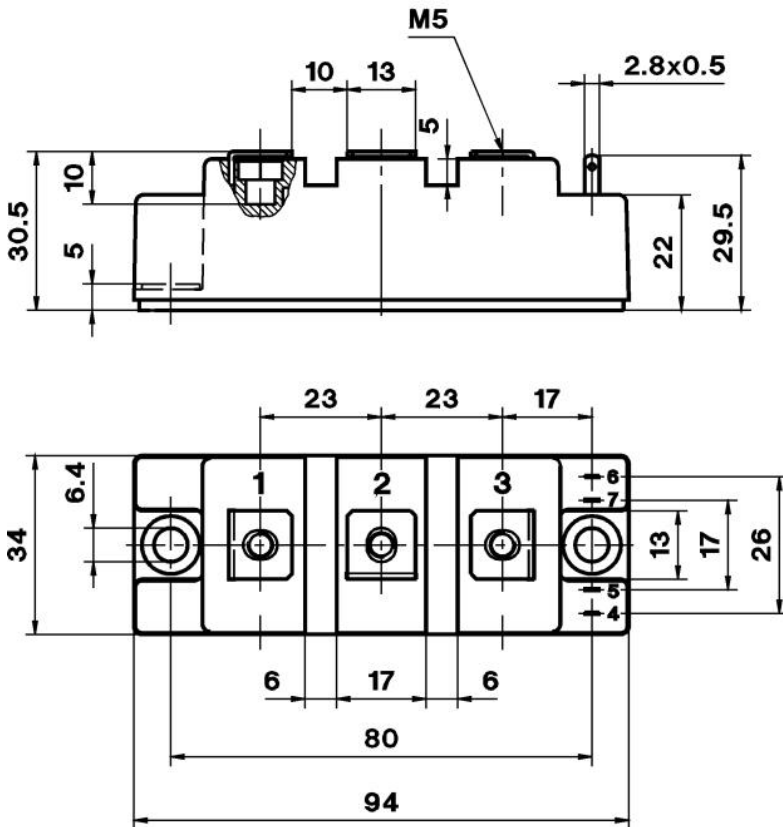- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary systems

GAL

Absolute Maximum Ratings		T_{case} = 25°C, unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT			
V_{CES}		1700	V
I_C	T_c = 25 (80) °C	160 (120)	A
I_{CRM}	t_p = 1 ms	200	A
V_{GES}		± 20	V
T_{vj}, (T_{stg})	$T_{OPERATION} \le T_{stg}$	- 40 ... +150 (125)	°C
V_{isol}	AC, 1 min.	4000	V
Inverse diode			
I_F	T_c = 25 (80) °C	140 (100)	A
I_{FRM}	t_p = 1 ms	200	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	1400	A
Freewheeling diode			
I_F	T_c = 25 (80) °C	140 (100)	A
I_{FRM}	t_p = 1 ms	200	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	1400	A

Characteristics			T_{case} = 25°C, unless otherwise specified		
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT					
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 3,5 mA	5,2	5,8	6,4	V
I_{CES}	V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25 (125) °C		0,1	0,3	mA
$V_{CE(TO)}$	T_j = 25 (125) °C		1 (0,9)	1,2 (1,1)	V
r_{CE}	V_{GE} = 15 V, T_j = 25 (125) °C		10 (15)	12,5	mΩ
$V_{CE(sat)}$	I_{Cnom} = 100 A, V_{GE} = 15 V, chip level		2 (2,4)	2,45	V
C_{ies}	under following conditions		7,1		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25 V, f = 1 MHz		0,4		nF
C_{res}			0,3		nF
L_{CE}				30	nH
$R_{CC'+EE'}$	res., terminal-chip T_c= 25 (125) °C		0,75 (1)		mΩ
$t_{d(on)}$	V_{CC} = 1200 V, I_{Cnom} = 100 A				ns
t_r	R_{Gon} = R_{Goff} = Ω, T_j = 125 °C				ns
$t_{d(off)}$	V_{GE} ± 15 V				ns
t_f					ns
E_{on} (E_{off})					mJ
Inverse diode					
V_F = V_{EC}	I_{Fnom} = 100 A; V_{GE} = 0 V; T_j = 25 (125) °C		1,6 (1,6)	1,9 (1,9)	V
$V_{(TO)}$	T_j = 25 (125) °C		1,1 (0,9)	1,3 (1,1)	V
r_T	T_j = 25 (125) °C		5 (7)	6 (8)	mΩ
I_{RRM}	I_{Fnom} = 100 A; T_j = 125 ( ) °C				A
Q_{rr}	di/dt = A/µs				µC
E_{rr}	V_{GE} = V				mJ
FWD					
V_F = V_{EC}	I_F = 100 A; V_{GE} = 0 V, T_j = 25 (125) °C		1,6 (1,6)	1,9 (1,9)	V
$V_{(TO)}$	T_j = 25 (125) °C		1,1 (0,9)	1,3 (1,1)	V
r_T	T_j = 25 (125) °C		5 (7)	6 (8)	mΩ
I_{RRM}	I_F = 100 A; T_j = 125 ( ) °C				A
Q_{rr}	di/dt = A/µs				µC
E_{rr}	V_{GE} = V				mJ
Thermal characteristics					
$R_{th(j-c)}$	per IGBT			0,18	K/W
$R_{th(j-c)D}$	per Inverse Diode			0,36	K/W
$R_{th(j-c)FD}$	per FWD			0,36	K/W
$R_{th(c-s)}$	per module			0,05	K/W
Mechanical data					
M_s	to heatsink M6	3		5	Nm
M_t	to terminals M5	2,5		5	Nm
w				160	g

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Dimensions in mm

CASED61

M5

10 13

2.8x0.5

5

10

30.5

5

22

29.5

23   23   17

6.4

34

1   2   3

6   7

13   17   26

5   4

6   17   6

80

94

Case D 62

G2
6
7
E2

C2

1
A1

2
E2

3
K1

GAL   Case D 62

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

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