

## SEMITRANS IGBT Modules

### Packaging, ESD Protection and Mounting Hardware \*)

The SEMITRANS IGBT Modules are electrostatic-sensitive devices (ESD). They are ESD-protected and packaged in SEMIBOX, i.e. corrugated paper boxes with L x W x H = 190 x 140 x 30 mm resp. 53 mm high. See SEMIKRON Book page C – 1.

One SEMIBOX includes 2 SEMITRANS-6 (Sixpack) modules or 8 SEMITRANS-2 or 3 SEMITRANS-3 or -4 modules. Larger quantities are packaged in packing units of 20 or 45 SEMITRANS-2, 12 or 20 pieces of SEMITRANS-3 or SEMITRANS 4, see table 2 below.

#### ESD protection

ESD protection against electrostatic damage to the very thin isolation layer underneath gate electrode ( $V_{GE} < 20\text{ V}$ ), i.e. by touching or rubbing isolating material, especially in dry weather, is provided as follows:

SEMITRANS 2 and SEMITRANS 3 have a conductive connecting piece ( $R < 1\text{ k}\Omega$ ) attached, or pushed on to the gate pins. The connecting pieces should stay attached after unpacking to avoid ESD electrostatic discharge damage until the modules are used in the assembly shop.

SEMITRANS 4 modules carry a conductive band, stuck to gate and auxiliary emitter terminal by a conductive glue, representing a resistance  $R < 1\text{ k}\Omega$ .

SEMITRANS-6 (SIXPACK) and -7 (SEVENPACK) are packed upside down, carried by a frame of corrugated paper the conductivity of which prevents charging of the gate during transport and on stock. When unpacking and afterwards handling precautions against electrostatic discharge have to be watched and grounded working places to be used.

#### Mounting Hardware

The mounting hardware is no longer automatically enclosed in the SEMIBOX, as many customers prefer to use different screws and FASTON connectors, which are already attached to the leads.

SEMIKRON offers - using separate ordering position - a universal mounting hardware bag (polyethylen bag) suitable for 10 SEMITRANS, containing screws with captive washers: Ident- Nr. 33321100. Larger quantities of the screws are available under their Ident-No. on request. (see table 1 below)

Content of 1 universal mounting kit 33321100 **)		U **	w **	SEMIKRON Ident-No.	Usage in pieces per each SEMITRANS ...					
Qty pcs.	Suitable for 10 SEMITRANS 2 to 4	pcs	kg		-1	-2	-3	-4	-4S	-6/-7
30	Posidrive screws M4x8 Z4-1 DIN 7985-4.8	1000	1,9	31947300	–	–	–	2	3	–
30	Posidrive screws M5x12 Z4-1 DIN 7985-4.8	600	2,3	32711300	–	3	–	–	–	2
30	Posidrive screws M6x12 Z4-1 DIN 7985-4.8	300	2,0	30058430	–	–	3	2	2	–
40	Posidrive screws M6x16 Z4-1 DIN 7985-4.8	400	2,9	31949100	–	2	4	4	4	–
50	Faston receptacles A 2,8-0,5 (2,8 x 0,5)	1000	0,1	31911400	–	4	4	–	–	12
180	Sum of accessory parts in 1 bag SEMIBOX A	1	1,0	33321100						
	For 10 SEMITRANS case M1 (MOSFET):									
20	Faston receptacles B2,8-1 (2,8 x 0,8)	1000	0,1	32020200	2					
10	Isolating sleeve for gate connector	400	0,8	32553900	1					
20	Posidrive screws M5x8 Z4-1 DIN 7985-4.8	800	2,7	32329900	2					
20	Posidrive screws M6x16 Z4-1 DIN 7985-4.8	400	2,9	31949100	2					
70	Sum of accessory parts in 1 bag		0,2	33217800						

\*) Deutsch → A – 194

\*\*) packed in SEMIBOX A

**Table 1 Usage of screws**

Quantity Q per package and weight w (gross)				With SEMITRANS - ...									
Type of package <b>preferred package</b> <sup>2)</sup>	Length L mm	Width W mm	Height H mm	-1		-2		-3		-4		-6 / -7	
				Q pcs	w kg	Q pcs	w kg	Q pcs	w kg	Q pcs	w kg	Q pcs	w kg
<b>SEMIBOX A (small)</b>	190	140	30	<b>6</b>	1,0	<b>8</b>	1,5	<b>3</b>	1,2	–	–	<b>2</b>	0,6
SEMIBOX B (high)	190	140	53	–	–	–	–	–	–	3	1,2	–	–
<b>SEMIBOX D (large)</b>	340	260	45	<b>10</b>	1,8	<b>20</b>	3,6	<b>12</b>	5,0	<b>12</b>	5,0	<b>10</b>	2,0
SEMIBOX G (extra large)	505	340	65/44 <sup>1)</sup>	4,2	7,5	45	8,2	20	8,4	20	8,4	20	4,0

<sup>1)</sup> Height of first SEMIBOX / second etc., each layer one upon another

<sup>2)</sup> In bold letters: preferred package

**Table 2 Packing units of SEMITRANS IGBT (and MOSFET) modules**

## SEMİTRANS® IGBT Modules 1000 to 1700 V

Cross Reference List Previous to Actual Types <sup>1)</sup>

Case (width)	SK-BOOK '90 / '91 1989 - 1991	SK-BOOK '92 / '93 1992 - 1995	Actual Type ≥ 1996 ... Low inductance high density	Actual Type ≥ 1998 <sup>4)</sup> low loss, f < 7 KHz
Sixpacks SEMİTRANS 6 (45 mm)	SKM 15 GD 100 D SKM 25 GD 100 D	SKM 22 GD 101 D SKM 22 GD 121 D SKM 40 GD 101 D SKM 40 GD 121 D	<b>SKM 22 GD 123 D</b> <b>SKM 22 GD 123 D</b> <b>SKM 40 GD 123 D</b> <b>SKM 40 GD 123 D</b> <b>SKM 75 GD 123 D</b>	– – SKM 40 GD 124 D SKM 40 GD 124 D SKM 75 GD 124 D
DUALS SEMİTRANS 2 (34 mm)	SKM 25 GB 100 D SKM 50 GB 100 D SKM 75 GB 100 D	SKM 40 GB 101 D SKM 40 GB 121 D SKM 50 GB 101 D SKM 50 GB 121 D SKM 75 GB 101 D SKM 75 GB 121 D SKM 100 GB 101 D SKM 100 GB 121 D	<b>SKM 50 GB 123 D</b> <b>SKM 50 GB 123 D</b> <b>SKM 50 GB 123 D</b> <b>SKM 50 GB 123 D</b> <b>SKM 75 GB 123 D</b> <b>SKM 75 GB 123 D</b> <b>SKM 100 GB 123 D</b> <b>SKM 100 GB 123 D</b> <b>SKM 145 GB 123 D</b>	– – – – SKM 75 GB 124 D SKM 75 GB 124 D SKM 100 GB 124 D SKM 100 GB 124 D SKM 145 GB 124 D
DUALS SEMİTRANS 3 (62mm)	SKM 100 GB 100 D <sup>2)</sup> SKM 150 GB 100 D <sup>2)</sup>	SKM 100 GB 102 D SKM 100 GB 122 D SKM 150 GB 101 D <sup>2)</sup> SKM 150 GB 102 D SKM 150 GB 121 D <sup>2)</sup> SKM 150 GB 122 D SKM 200 GB 101 D <sup>2)</sup> SKM 200 GB 102 D SKM 200 GB 121 D <sup>2)</sup> SKM 200 GB 122 D	<b>SKM 150 GB 123 D</b> <b>SKM 150 GB 123 D</b> – <b>SKM 150 GB 123 D</b> – <b>SKM 150 GB 123 D</b> – <b>SKM 200 GB 123 D</b> – <b>SKM 200 GB 123 D</b> <b>SKM 300 GB 123 D</b>	SKM 150 GB 124 D SKM 150 GB 124 D – SKM 150 GB 124 D – SKM 150 GB 124 D – SKM 200 GB 124 D – SKM 200 GB 124 D SKM 300 GB 124 D
SINGLES SEMİTRANS 4 (62 mm)	SKM 200 GA 100 D SKM 300 GA 100 D	SKM 200 GA 102 D SKM 200 GA 122 D SKM 300 GA 102 D SKM 300 GA 122 D SKM 400 GA 102 D SKM 400 GA 122 D	<b>SKM 200 GA 123 D</b> <b>SKM 200 GA 123 D</b> <b>SKM 300 GA 123 D</b> <b>SKM 300 GA 123 D</b> <b>SKM 400 GA 123 D</b> <b>SKM 400 GA 123 D</b> <b>SKM 500 GA 123 D</b>	– – – – SKM 400 GA 124 D SKM 400 GA 124 D SKM 500 GA 124 D

## SEMİTRANS® IGBT Modules 1600 to 1700 V

Case (width)	Datasheet 1/94 1994 - 1995	Actual Type <sup>3)</sup> ≥ 1996 ...	High density low loss <sup>4)</sup> ≥ 1998, f < 3 KHz
DUAL SEMİTRANS 2 (34 mm)	SKM 75 GB 161 D SKM 100 GB 161 D	<b>SKM 75 GB 173 D</b> <b>SKM 100 GB 173 D</b>	– –
DUAL SEMİTRANS 3 (62 mm)	SKM 150 GB 162 D SKM 200 GB 161 D	<b>SKM 150 GB 173 D</b> <b>SKM 200 GB 173 D</b>	– SKM 200 GB 174 D SKM 300 GB 174 D
SINGLE SEMİTRANS 4 (62 mm)	SKM 300 GA 162 D SKM 400 GA 162 D	<b>SKM 300 GA 173 D</b> <b>SKM 400 GA 173 D</b>	SKM 300 GA 174 D SKM 400 GA 174 D SKM 500 GA 174 D

<sup>1)</sup> For SKM ... GAL and SKM ... GAR (Chopper) types: replace „GB“ by „GAL“ resp. „GAR“

<sup>2)</sup> Case of bipolar transistor modules with ridges, distance of main terminals was 2x25 mm (instead of now 2x28 mm), were discontinued.

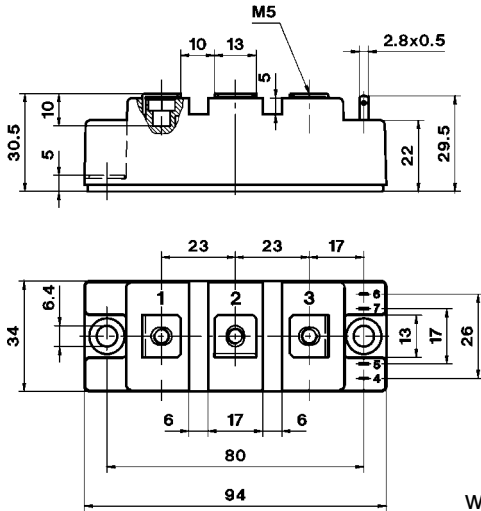
<sup>3)</sup> 1600 V types are replaced by 1700 V types only

<sup>4)</sup> Prior to replacing see pages A – 65 etc. to adapt driver

### SEMITRANS® 2

Case D 61 (D 62, D 63)

CASED61

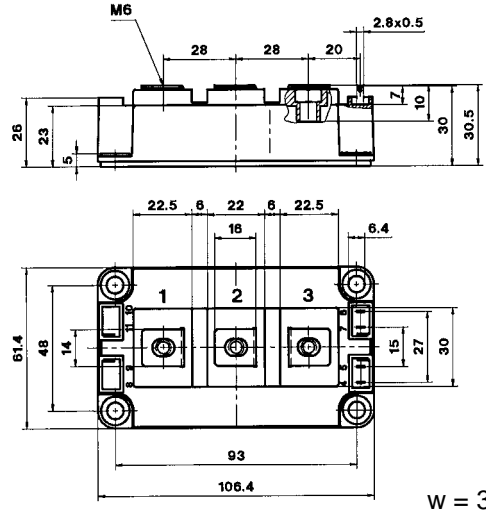


w = 160 g

### SEMITRANS® 3

Case D 56 (D 57, D 58)

CASED56

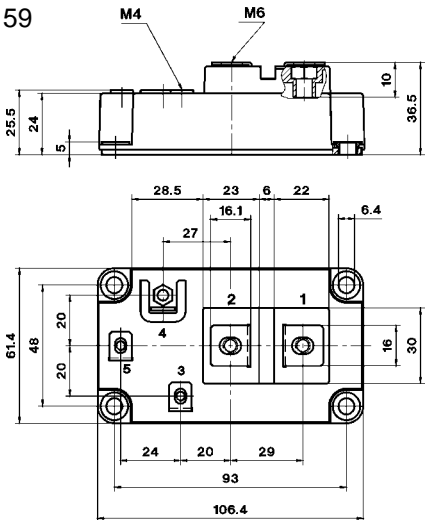


w = 325 g

### SEMITRANS® 4

Case D 59

CASED59



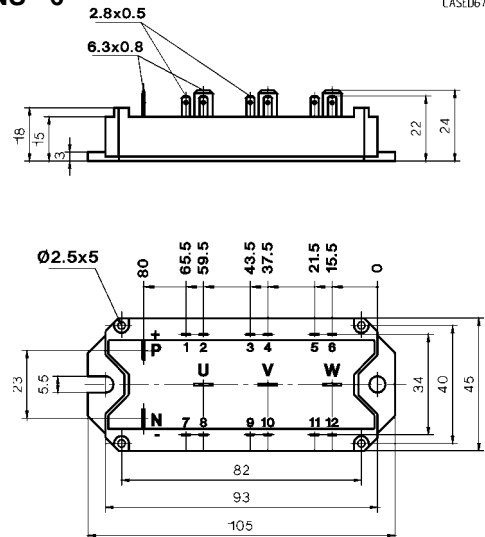
w = 330 g

SEMITRANS 4 S: with Terminal 4 = collector sense

### SEMITRANS® 6

Sixpack  
Case D 67

CASED67



w = 175 g

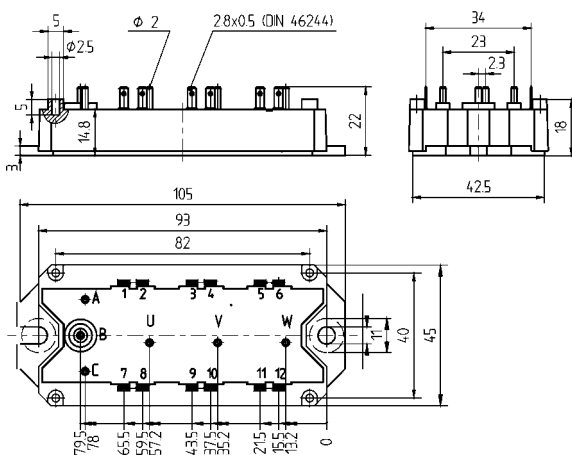
### SEMITRANS® 6L - Sixpack

Case D 68 \*)

### SEMITRANS® 7 - SEVENPACK

Case D 73

CASEU73



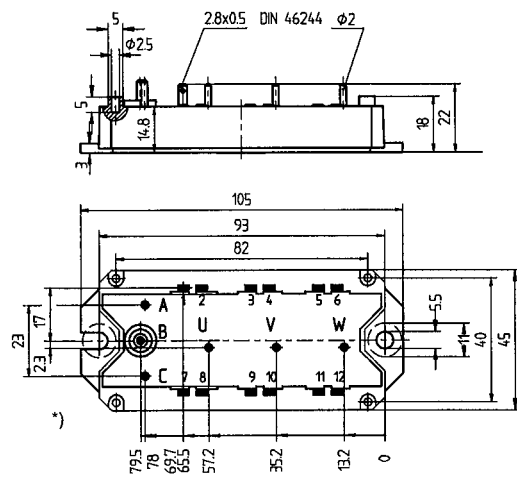
Dimensions in mm \*) without pin „B“

w = 175 g

### SEMITRANS® 7 D - (7 Diodes Pack = Sixpack modified)

Case D 69 A

CASED69A



w = 175 g