

# SKM 200 MLI 066 T



**SEMITRANS<sup>®</sup> 5**

## Trench IGBT Modules

### SKM 200 MLI 066 T

#### Target Data

#### Features

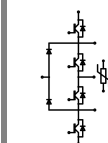
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$  with positive temperature coefficient
- Integrated NTC temperature sensor

#### Typical Applications

- UPS
- 3 Level Inverter

#### Remarks

- Case temperature limited to  $T_c = 125^\circ\text{C}$  max, recommended  $T_{op} = -40..+150^\circ\text{C}$



MLI-T

Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values	Units	
<b>IGBT</b>				
$V_{CES}$	$T_j = 25^\circ\text{C}$	600	V	
$I_C$	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	280	A
		$T_c = 80^\circ\text{C}$	210	A
$I_{CRM}$	$I_{CRM} = 2 \times I_{Cnom}$	400	A	
$V_{GES}$		$\pm 20$	V	
$t_{psc}$	$V_{CC} = 360\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 600\text{ V}$	6	$\mu\text{s}$	
<b>Inverse Diode</b>				
$I_F$	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	270	A
		$T_c = 80^\circ\text{C}$	200	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	400	A	
$I_{FSM}$	$t_p = 10\text{ ms};$ half sine wave $T_j = 150^\circ\text{C}$	1310	A	
<b>Freewheeling Diode</b>				
$I_F$	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	270	A
		$T_c = 80^\circ\text{C}$	200	A
$I_{FRM}$	$I_{FRM} = 2 \times I_{Fnom}$	400	A	
$I_{FSM}$	$t_p = 10\text{ ms};$ half sine wave $T_j = 150^\circ\text{C}$	1310	A	
<b>Module</b>				
$I_{t(RMS)}$		500	A	
$T_{vj}$		- 40 ... + 175	$^\circ\text{C}$	
$T_{stg}$		- 40 ... + 125	$^\circ\text{C}$	
$V_{isol}$	AC, 1 min.	2500	V	

Characteristics		$T_{case} = 25^\circ\text{C}$ , unless otherwise specified				
Symbol	Conditions	min.	typ.	max.	Units	
<b>IGBT</b>						
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3,2\text{ mA}$	5	5,8	6,5	V	
$I_{CES}$	$V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ $T_j = 25^\circ\text{C}$			0,01	mA	
$I_{GES}$	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}$ $T_j = 25^\circ\text{C}$			1200	nA	
$V_{CE0}$			$T_j = 25^\circ\text{C}$	0,9	1	V
			$T_j = 150^\circ\text{C}$	0,7	0,8	V
$r_{CE}$	$V_{GE} = 15\text{ V}$		$T_j = 25^\circ\text{C}$	2,7	4,5	$\text{m}\Omega$
			$T_j = 150^\circ\text{C}$	5	6,5	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 200\text{ A}, V_{GE} = 15\text{ V}$		$T_j = 25^\circ\text{C}_{chiplev.}$	1,45	1,9	V
			$T_j = 150^\circ\text{C}_{chiplev.}$	1,7	2,1	V
$C_{ies}$	$V_{CE} = 25, V_{GE} = 0\text{ V}$ $f = 1\text{ MHz}$			12,3		nF
$C_{oes}$				0,76		nF
$C_{res}$				0,36		nF
$R_{Gint}$	$T_j = ^\circ\text{C}$		1		$\Omega$	
$t_{d(on)}$	$R_{Gon} = 2,4\ \Omega$	$V_{CC} = 300\text{ V}$ $I_C = 200\text{ A}$				ns
$t_r$						ns
$E_{on}$	$R_{Goff} = 2,4\ \Omega$	$T_j = 150^\circ\text{C}$ $V_{GE} = -8\text{ V}/+15\text{ V}$				mJ
$t_{d(off)}$						ns
$t_f$						ns
$E_{off}$						mJ
$R_{th(j-c)}$	per IGBT		0,21			K/W

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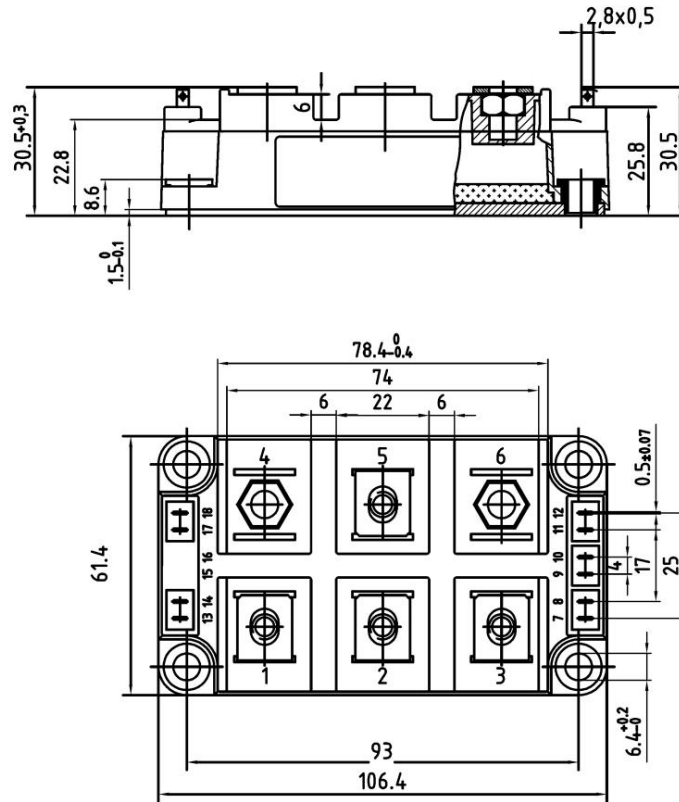
**MLI-T**

Characteristics					
Symbol	Conditions	min.	typ.	max.	Units
<b>Inverse Diode</b>					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,4	1,6	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	1,4	1,6	V
$V_{F0}$		$T_j = 25^\circ\text{C}$	0,95	1	V
		$T_j = 150^\circ\text{C}$	0,85	0,9	V
$r_F$		$T_j = 25^\circ\text{C}$	2	3	mΩ
		$T_j = 150^\circ\text{C}$	2,7	3,5	mΩ
$I_{RRM}$	$I_F = 200 \text{ A}$				A
$Q_{rr}$					μC
$E_{rr}$	$V_{GE} = -8 \text{ V}; V_{CC} = 300 \text{ V}$				mJ
$R_{th(j-c)D}$	per diode		0,39		K/W
<b>Free-wheeling diode (Neutral Clamp Diode)</b>					
$V_F = V_{EC}$	$I_{Fnom} = 200 \text{ A}; V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,4	1,6	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	1,4	1,6	V
$V_{F0}$		$T_j = 25^\circ\text{C}$	0,95	1	V
		$T_j = 150^\circ\text{C}$	0,85	0,9	V
$r_F$		$T_j = 25^\circ\text{C}$	2	3	V
		$T_j = 150^\circ\text{C}$	2,7	3,5	V
$I_{RRM}$	$I_F = 200 \text{ A}$				A
$Q_{rr}$					μC
$E_{rr}$	$V_{GE} = 0 \text{ V}; V_{CC} = 600 \text{ V}$				mJ
$R_{th(j-c)FD}$	per diode		0,39		K/W
$M_s$	to heat sink M6	3		5	Nm
$M_t$	to terminals M6	2,5		5	Nm
w				310	g
<b>Temperature sensor</b>					
$R_{100}$	$T_s = 100^\circ\text{C} (R_{25} = 5\text{k}\Omega)$		493±5%		Ω K

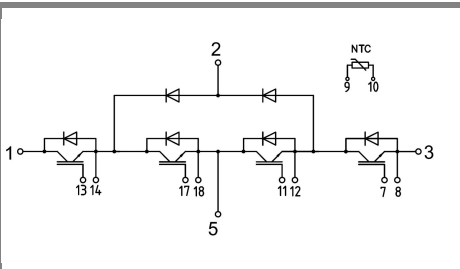
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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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Case D60



MLI-T

Case D60