SK280MB10

SEMITOP® 3

Half-Bridge (MOSFET module)

SK280MB10

Features*

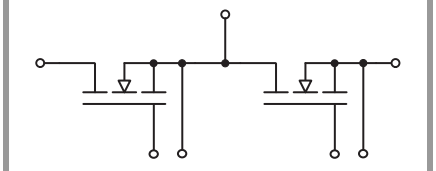
- One screw mounting module
- Low inductive design
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- 100V Trench MOS technology
- UL recognized file no. E 63 532

Typical Applications

- Switched Mode Power Supplies

Remarks

Recommended driving for optimal switching performances: V_{GS}=0/10V



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Absolute Maximum Ratings				
Symbol	**Conditions**		**Values**	**Unit**
MOSFET 1				
V_{DSS}			100	V
I_D	T_j = 175 °C	T_s = 25 °C	335	A
		T_s = 70 °C	280	A
I_{DM}			960	A
I_{DRM}			320	A
V_{GS}			-20 ... 20	V
T_j			-40 ... 175	°C
Integrated body diode				
I_{FM}			960	A
I_{FRM}			320	A

Absolute Maximum Ratings			
Symbol	**Conditions**	**Values**	**Unit**
Module			
$I_{t(RMS)}$	$\Delta T_{terminal}$ at PCB joint = 30 K, per pin	60	A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, t = 1 min	2500	V

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
MOSFET 1						
$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA, T_j = 25 °C		100			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 0.55 mA, T_j = 25 °C		2	2.7	3.5	V
I_{DSS}	V_{GS} = 0 V, V_{DS} = 100 V, T_j = 25 °C				0.2	mA
I_{GSS}	V_{DS} = 0 V, V_{GS} = 20 V, T_j = 25 °C				200	nA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 200 A chiplevel	T_j = 25 °C		1.15	1.35	mΩ
		T_j = 150 °C		2.1		mΩ
C_{iss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz			22200		pF
C_{oss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz			3880		pF
C_{rss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz			138		pF
R_{Gint}	T_j = 25 °C			4		Ω
Q_G	V_{GS}= 0…+15 V, V_{DD} = 50 V, I_D = 200 A			530		nC
$t_{d(on)}$	V_{DD} = 50 V	T_j = 150 °C		190		ns
$t_{d(off)}$	V_{GS} = 15/0 V	T_j = 150 °C		1000		ns
t_r	I_D = 200 A	T_j = 150 °C		133		ns
t_f	$R_{G\ on/off}$ = 15 Ω	T_j = 150 °C		97		ns
E_{on}	di/dt_{off} = 1.6 kA/µs	T_j = 150 °C		0.2		mJ
E_{off}	di/dt_{on} = 1.4 kA/µs, dv/dt = 637 kV/µs	T_j = 150 °C		2.1		mJ
$R_{th(j-s)}$	per MOSFET, λ_{paste}=0.8 W/(mK)			0.47		K/W
Integrated body diode						
$V_F = V_{SD}$	$-I_D$ = 200 A, V_{GS} = 0 V chiplevel	T_j = 25 °C		0.88		V
		T_j = 150 °C		0.77		V
$V_{F0} = V_{SD0}$	chiplevel	T_j = 25 °C		0.71		V
		T_j = 150 °C		0.53		V
$r_F = r_{SD}$	chiplevel	T_j = 25 °C		0.85		mΩ
		T_j = 150 °C		1.20		mΩ
t_{rr}	V_{DD} = 50 V	T_j = 150 °C		90		ns
Q_{rr}	$-I_D$ = 200 A	T_j = 150 °C		2.7		µC
I_{rr}	di/dt_{off} = 1.4 kA/µs	T_j = 150 °C		60		A
E_{rr}	V_{GS} = 0 V	T_j = 150 °C		0.1		mJ

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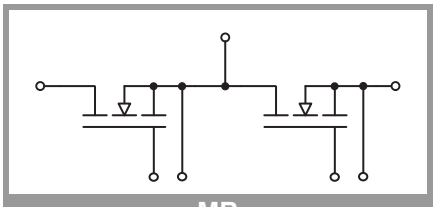
Characteristics					
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
Module					
L_{CE}			5		nH
M_s	to heatsink	2.25		2.5	Nm
w	weight		29		g



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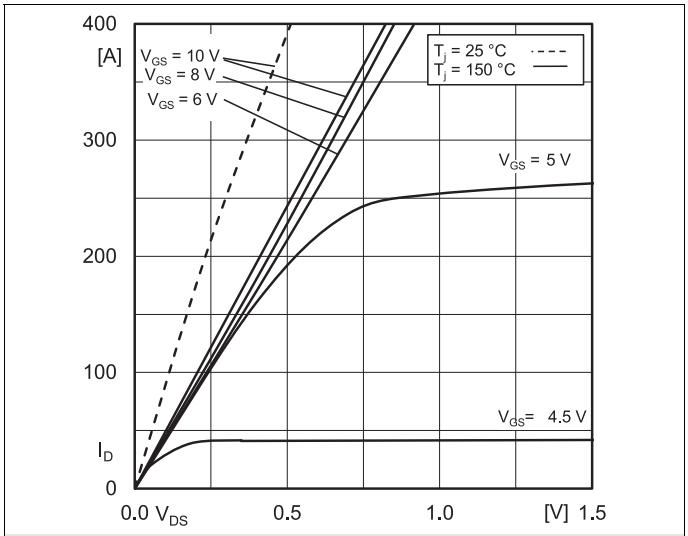


Fig.1: Typ. MOSFET forward output characteristic, incl. $R_{DD'+SS'}$

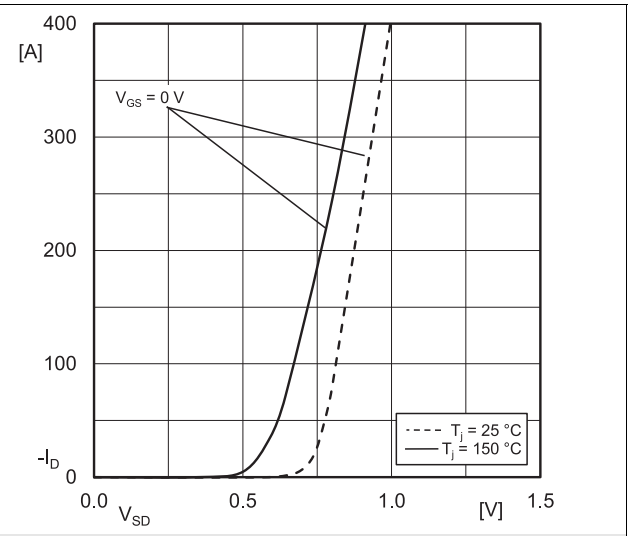


Fig. 2: Typ. reverse output characteristic, incl. $R_{DD'+SS'}$

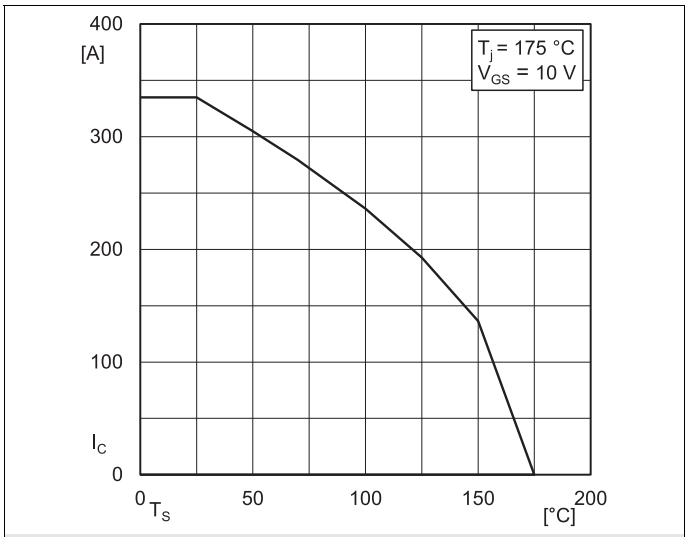


Fig. 3: Rated current vs. temperature $I_D = f(T_S)$

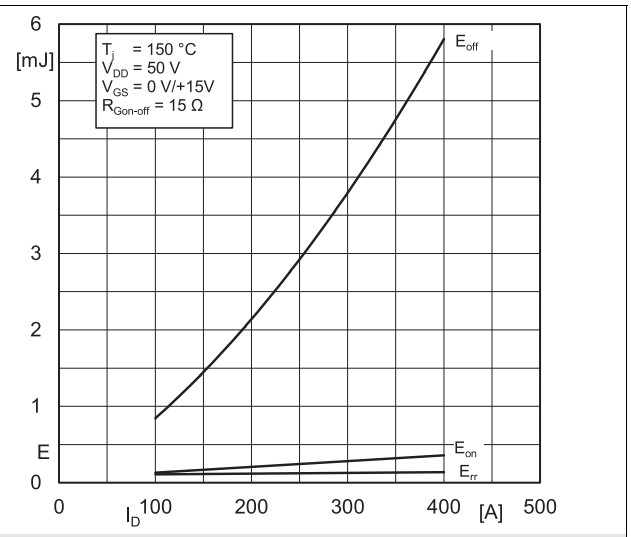


Fig. 4: Typ. turn-on/-off energy $E = f(I_D)$

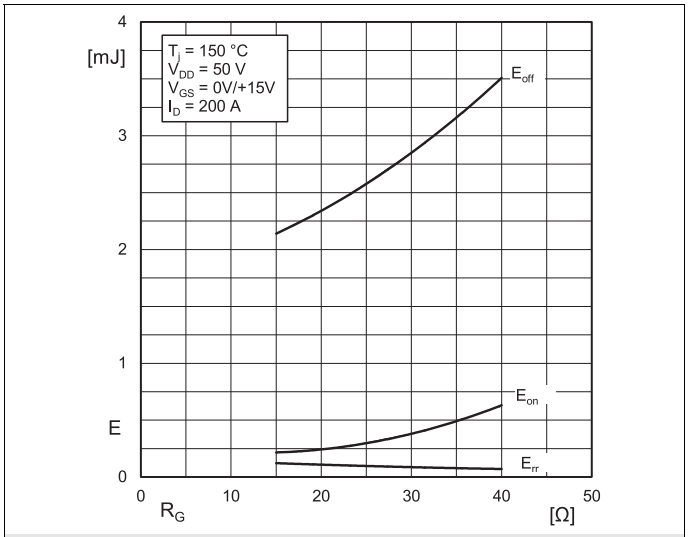


Fig. 5: Typ. turn-on /-off energy $E = f(R_G)$

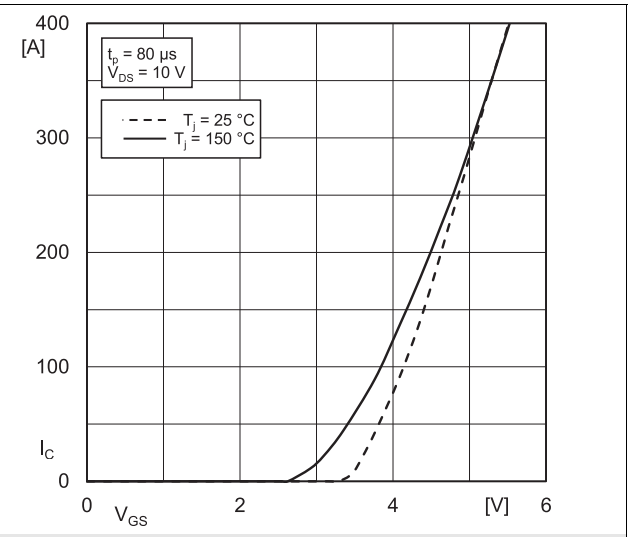
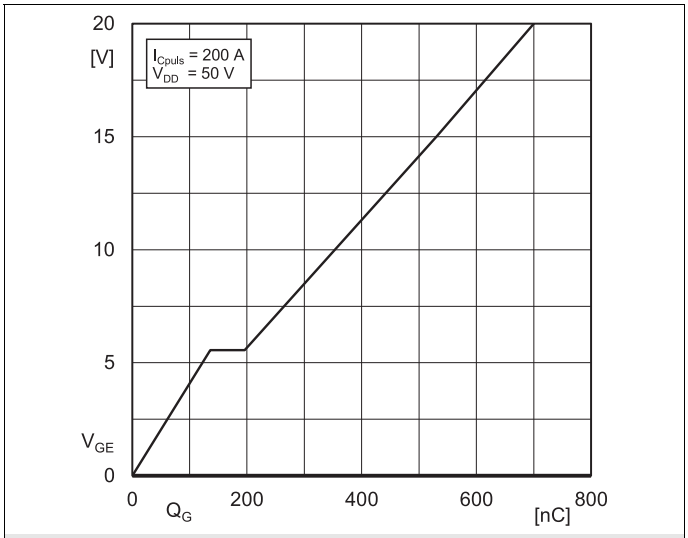


Fig. 6: Typ. MOSFET transfer characteristic



Flg. 7: Typ. MOSFET gate charge characteristic

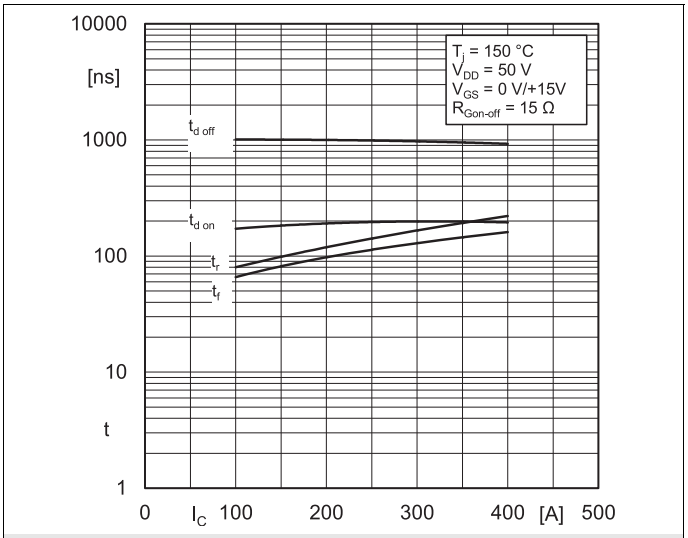


Fig. 8: Typ. switching times vs. I_D

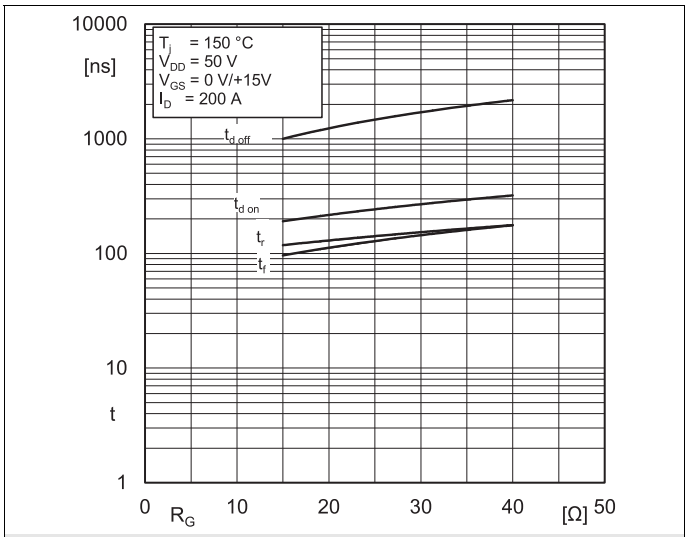


Fig. 9: Typ. switching times vs. gate resistor R_G

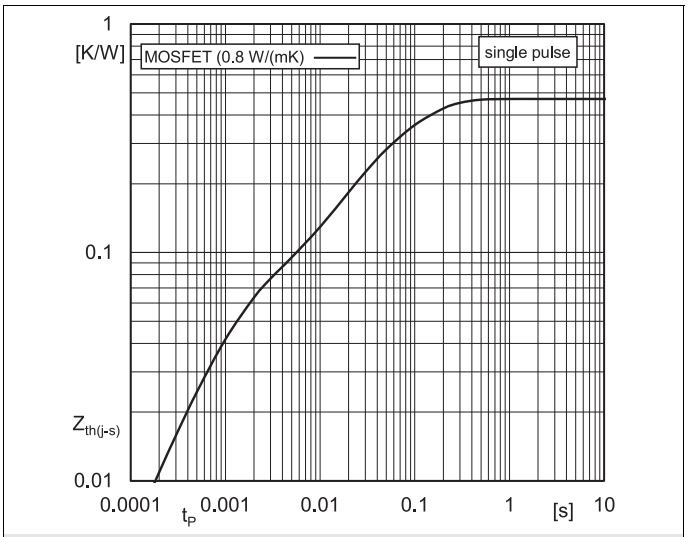
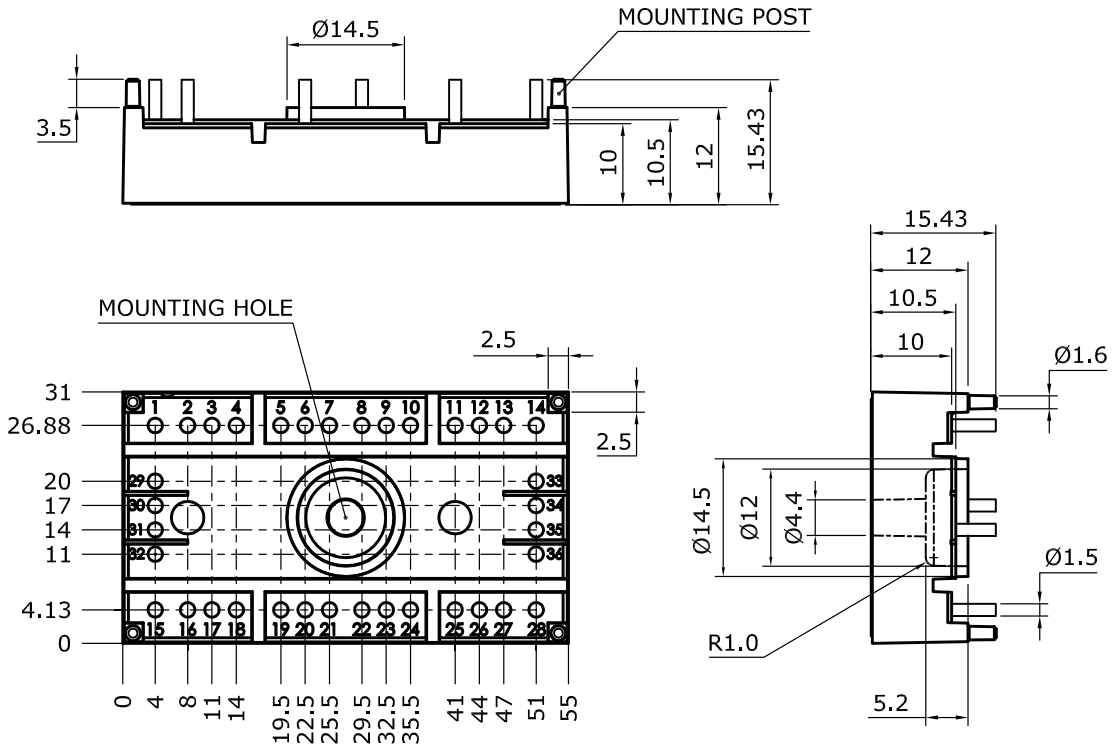


Fig. 10: Typ. transient thermal impedance

Dimensions: mm
Tolerance system: ISO 2768-m



Suggested hole diameter for solder pins in the circuit board:

- 2.0 mm

Suggested hole diameter for the mounting post in the circuit board:

- 2.0 mm

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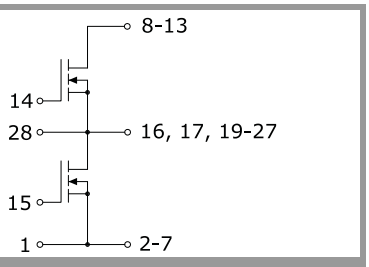

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This is an electrostatic discharge sensitive device (ESDS) due to international standard IEC 61340.

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