

SK280MB10



SEMITOP® 3

Half-Bridge (MOSFET module)

SK280MB10

Features*

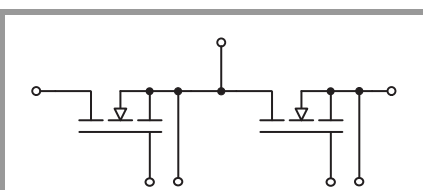
- One screw mounting module
- Low inductive design
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- 100V Trench MOS technology
- UL recognized file no. E 63 532

Typical Applications

- Switched Mode Power Supplies

Remarks

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



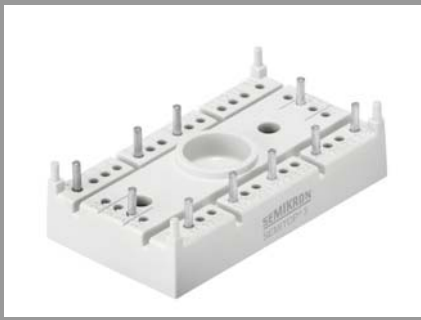
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Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
MOSFET 1				
V_{DSS}		100	V	
I_D	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	335	A
		$T_s = 70\text{ °C}$	280	A
I_{DM}		960	A	
I_{DRM}		320	A	
V_{GS}		-20 ... 20	V	
T_j		-40 ... 175	°C	
Integrated 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					
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$, $T_j = 25\text{ °C}$	100			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 0.55\text{ mA}$, $T_j = 25\text{ °C}$	2	2.7	3.5	V
I_{DSS}	$V_{GS} = 0\text{ V}$, $V_{DS} = 100\text{ V}$, $T_j = 25\text{ °C}$			0.2	mA
I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = 20\text{ V}$, $T_j = 25\text{ °C}$			200	nA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ $I_D = 200\text{ A}$ chipllevel	$T_j = 25\text{ °C}$	1.15	1.35	mΩ
		$T_j = 150\text{ °C}$	2.1		mΩ
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 50\text{ V}$, f = 1 MHz		22200		pF
C_{oss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 50\text{ V}$, f = 1 MHz		3880		pF
C_{rss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 50\text{ V}$, f = 1 MHz		138		pF
R_{Gint}	$T_j = 25\text{ °C}$		4		Ω
Q_G	$V_{GS} = 0...+15\text{ V}$, $V_{DD} = 50\text{ V}$, $I_D = 200\text{ A}$		530		nC
$t_{d(on)}$	$V_{DD} = 50\text{ V}$		190		ns
$t_{d(off)}$	$V_{GS} = 15/0\text{ V}$ $I_D = 200\text{ A}$	$T_j = 150\text{ °C}$		1000	ns
		$T_j = 150\text{ °C}$			
t_r	$R_{G\ on/off} = 15\text{ }\Omega$		133		ns
t_f	$di/dt_{off} = 1.6\text{ kA}/\mu\text{s}$		97		ns
E_{on}	$di/dt_{on} = 1.4\text{ kA}/\mu\text{s}$		0.2		mJ
E_{off}	$dv/dt = 637\text{ kV}/\mu\text{s}$		2.1		mJ
$R_{th(j-s)}$	per MOSFET, $\lambda_{paste} = 0.8\text{ W}/(\text{mK})$		0.47		K/W
Integrated body diode					
$V_F = V_{SD}$	$-I_D = 200\text{ A}$ $V_{GS} = 0\text{ V}$ chipllevel	$T_j = 25\text{ °C}$	0.88		V
		$T_j = 150\text{ °C}$	0.77		V
$V_{F0} = V_{SD0}$	chipllevel	$T_j = 25\text{ °C}$	0.71		V
		$T_j = 150\text{ °C}$	0.53		V
$r_F = r_{SD}$	chipllevel	$T_j = 25\text{ °C}$	0.85		mΩ
		$T_j = 150\text{ °C}$	1.20		mΩ
t_{rr}	$V_{DD} = 50\text{ V}$	$T_j = 150\text{ °C}$	90		ns
Q_{rr}	$-I_D = 200\text{ A}$	$T_j = 150\text{ °C}$	2.7		μC
I_{rr}	$di/dt_{off} = 1.4\text{ kA}/\mu\text{s}$	$T_j = 150\text{ °C}$	60		A
E_{rr}	$V_{GS} = 0\text{ V}$	$T_j = 150\text{ °C}$	0.1		mJ

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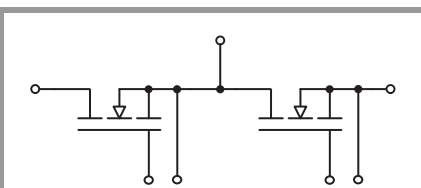
Typical Applications

- Switched Mode Power Supplies

Remarks

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

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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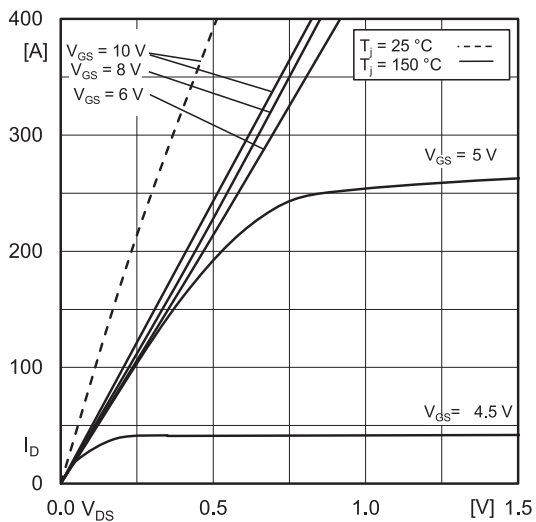


Fig. 1: Typ. MOSFET forward output characteristic, incl. $R_{DD'+SS}$

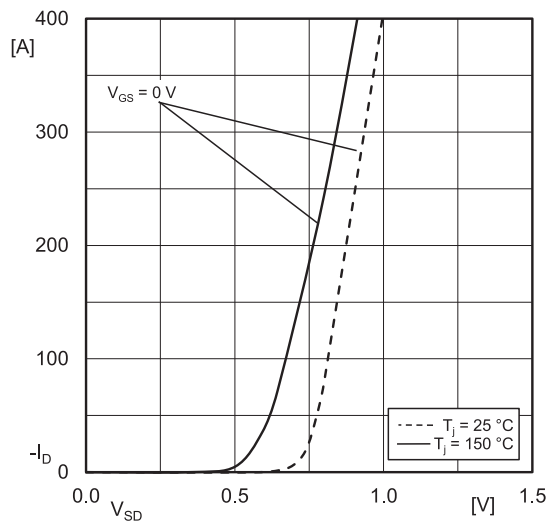


Fig. 2: Typ. reverse output characteristic, incl. $R_{DD'+SS}$

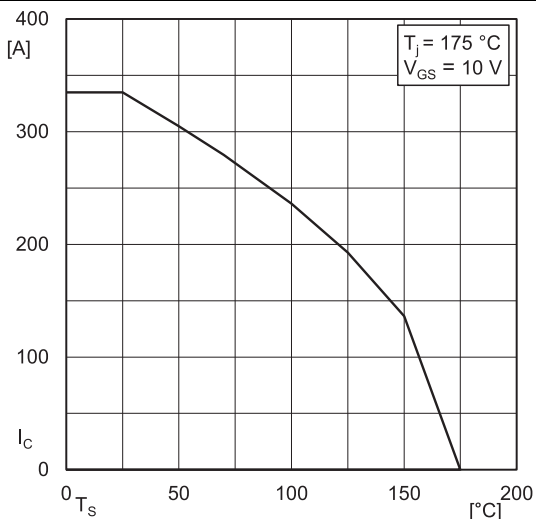


Fig. 3: Rated current vs. temperature $I_D = f(T_s)$

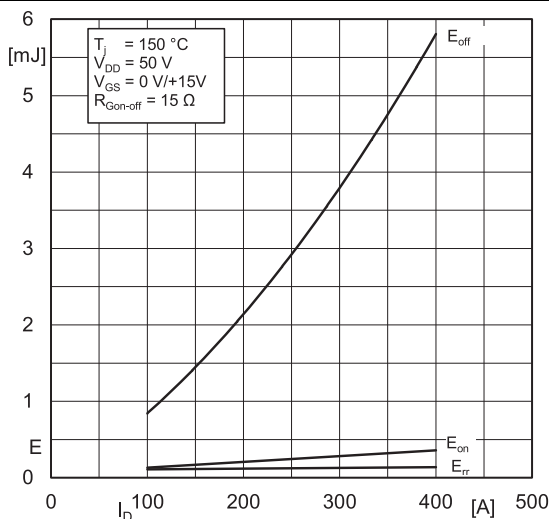


Fig. 4: Typ. turn-on/off energy $E = f(I_D)$

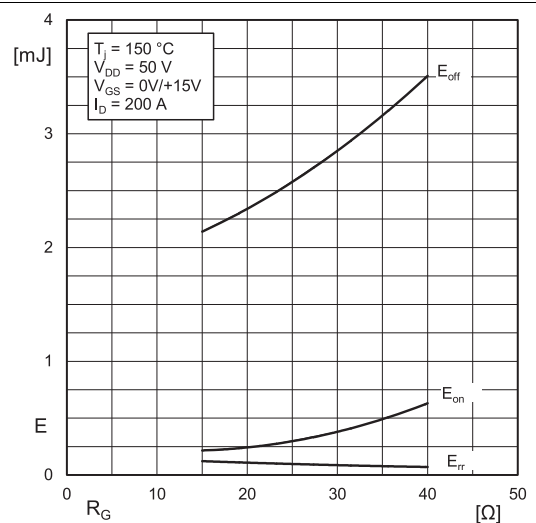


Fig. 5: Typ. turn-on /off energy $E = f(R_G)$

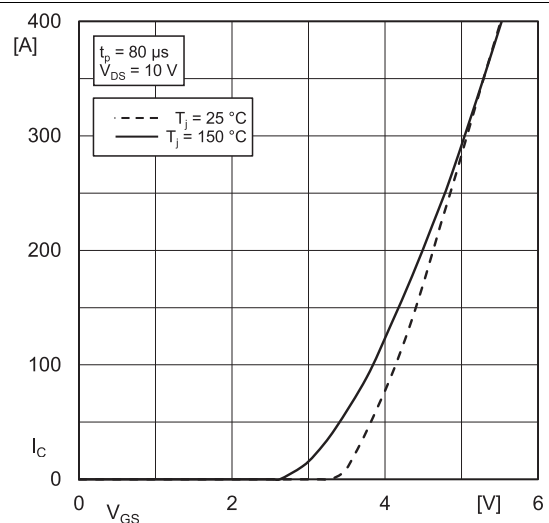


Fig. 6: Typ. MOSFET transfer characteristic

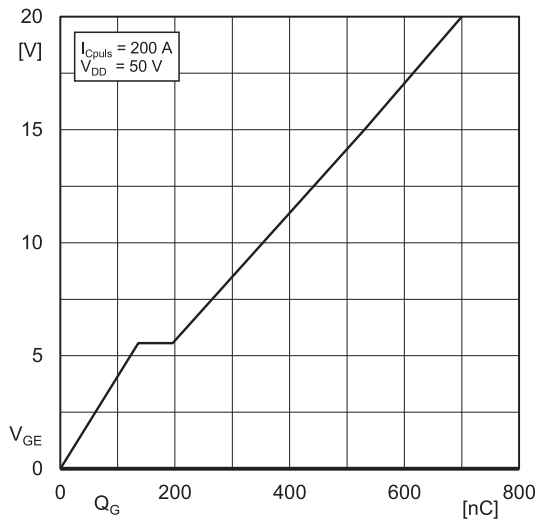


Fig. 7: Typ. MOSFET gate charge characteristic

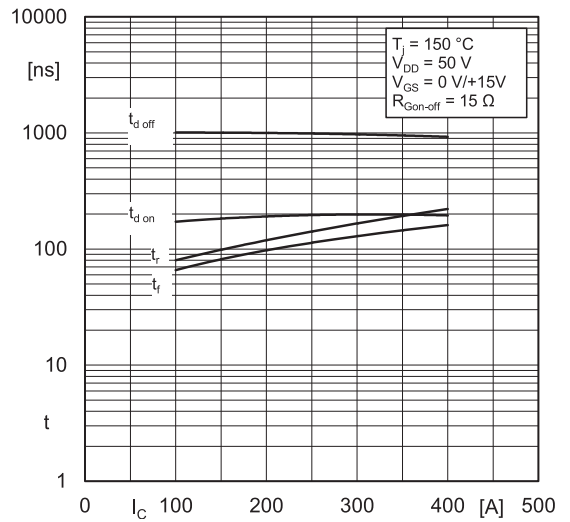


Fig. 8: Typ. switching times vs. I_D

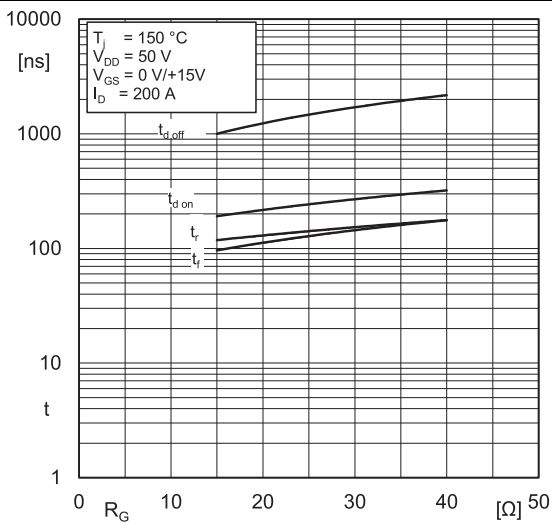


Fig. 9: Typ. switching times vs. gate resistor R_G

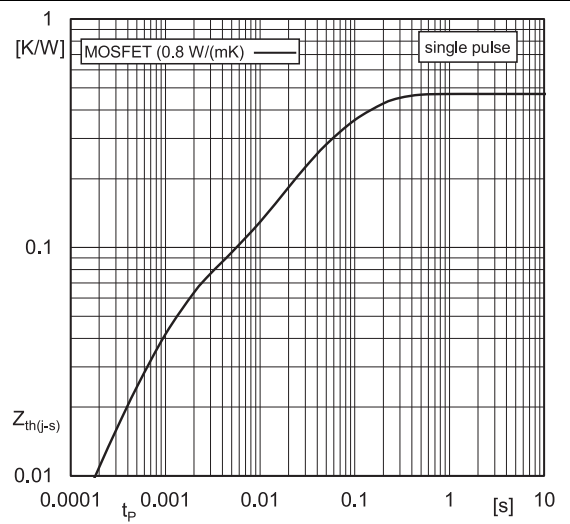
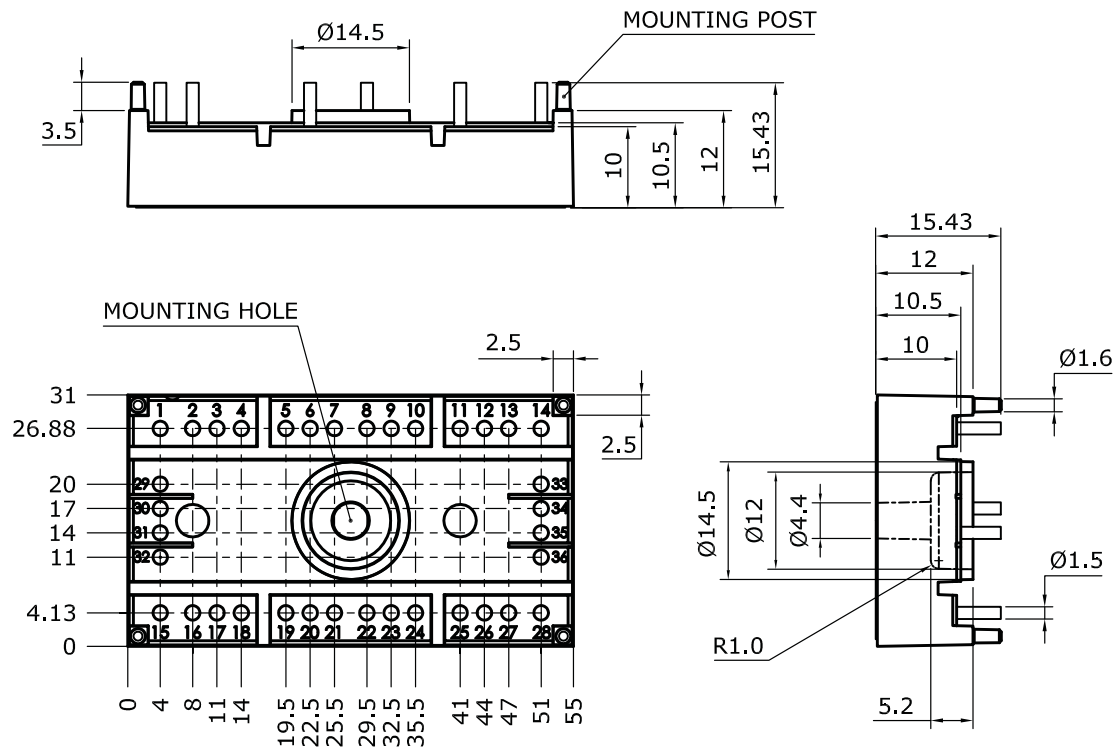


Fig. 10: Typ. transient thermal impedance

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Dimensions: mm

Tolerance system: ISO 2768-m



Suggested hole diameter for solder pins in the circuit board:

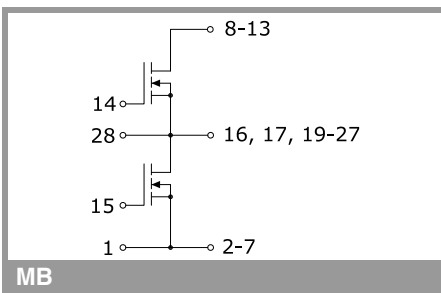
- 2.0 mm

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

- 2.0 mm

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

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