



SEMIRANS™ M1

Power MOSFET Modules

SKM 180A020

Features

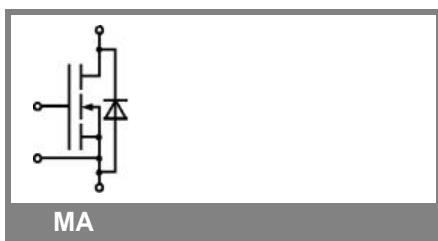
- N Channel, enhancement mode
- Avalanche characteristics
- Short internal connections avoid oscillations
- Isolated copper baseplates
- All electrical connections on top for easy busbaring
- Large clearance (10mm) and creepage distances (13mm)
- UL recognized, file no. E 63 532

Typical Applications*

- Switched mode power supplies
- DC servo and robot drives
- DC choppers
- UPS equipment
- Plasma cutting
- Not suitable for linear amplification

Absolute Maximum Ratings		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
V_{DS}		200		V
I_D	$T_s = 25 \text{ (80)}^\circ\text{C}$	180 (135)		A
I_{DM}	1 ms	540		A
V_{GS}		± 20		V
$T_{vj}, (T_{stg})$		- 40 ... + 150 (125)		°C
V_{isol}	AC, 1 min.	2500		V
Inverse diode				
$I_F = - I_S$		180		A
$I_{FM} = - I_{SM}$		540		A

Characteristics		$T_c = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	min.	typ.	max.
$V_{(BR)DSS}$	$V_{GS} = 0 \text{ V}$, $I_D = 0,25 \text{ mA}$	200		V
$V_{GS(\text{th})}$	$V_{GS} = V_{DS}$, $I_D = 1 \text{ mA}$	2,1	3	4
I_{DSS}	$V_{GS} = 0 \text{ V}$, $V_{DS} = 200 \text{ V}$, $T_j = 25 \text{ (125)}^\circ\text{C}$		50 (300)	250 (1000)
I_{GSS}	$V_{GS} = 20 \text{ V}$, $V_{DS} = 0 \text{ V}$		10	100
$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 110 \text{ A}$		9	11
g_{fs}	$V_{DS} = 25 \text{ V}$, $I_D = 110 \text{ A}$	80	100	S
C_{CHC}	$V_{GS} = 0$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$			160
C_{iss}			16	nF
C_{oss}			3	nF
C_{rss}			1,5	nF
L_{DS}			20	nH
$t_{d(\text{on})}$	$V_{DD} = 100 \text{ V}$, $I_D = 80 \text{ A}$,		100	ns
t_r	$V_{GS} = 10 \text{ V}$, $R_G = 3,3 \Omega$		200	ns
$t_{d(\text{off})}$			900	ns
t_f			220	ns
Inverse diode				
V_{SD}	$I_F = 360 \text{ A}$; $V_{GS} = 0 \text{ V}$		1,3	V
t_{rr}	$T_j = 25 \text{ (125)}^\circ\text{C}$		500	ns
Q_{rr}	$T_j = 25^\circ\text{C}$		10 (12)	μC
I_{rr}	$T_j = {}^\circ\text{C}$			A
Thermal characteristics				
$R_{th(j-c)}$	per MOSFET		0,18	K/W
$R_{th(c-s)}$	M_s , surface 10 μm , per module		0,05	K/W
Mechanical data				
M_s	to heatsink (M6)	4	5	Nm
M_t	for terminals (M5)			Nm
w			130	g



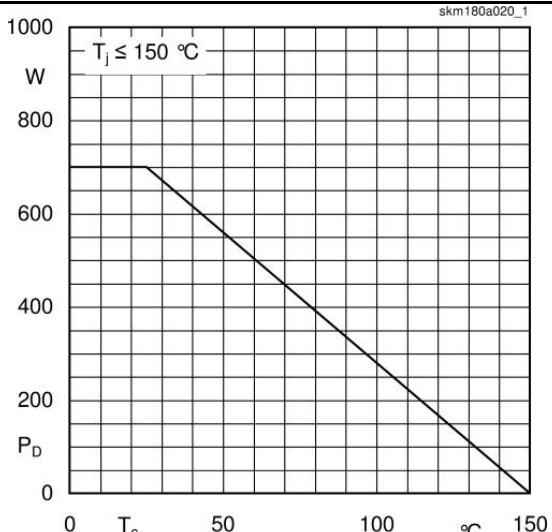


Fig. 1 Rated power dissipation vs. temperature

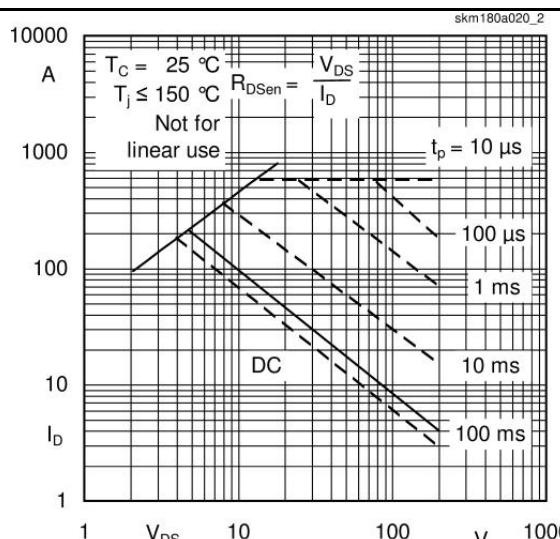


Fig. 2 Maximum safe operating area

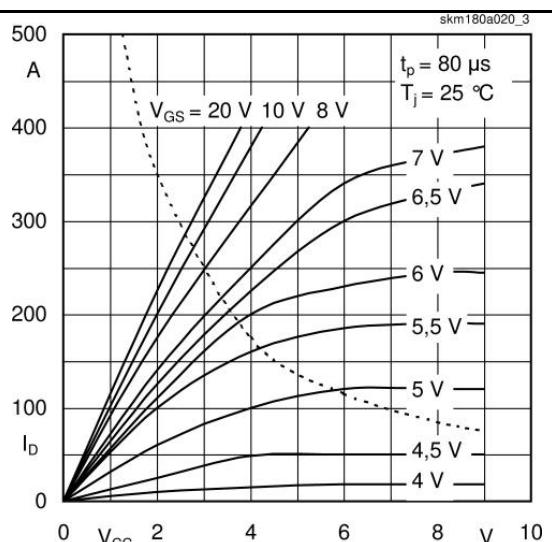


Fig. 3 Output characteristic

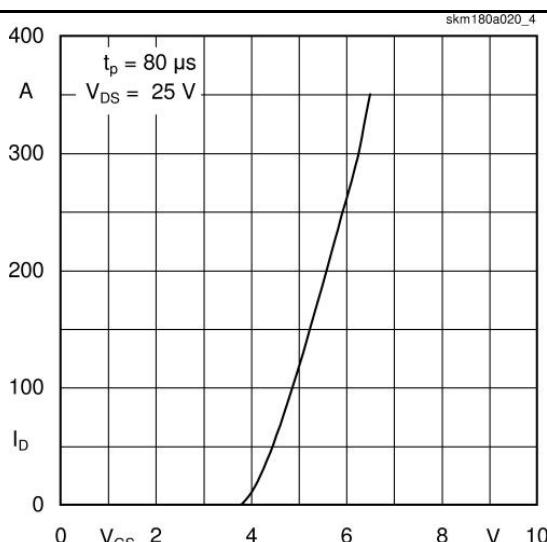


Fig. 4 Transfer characteristic

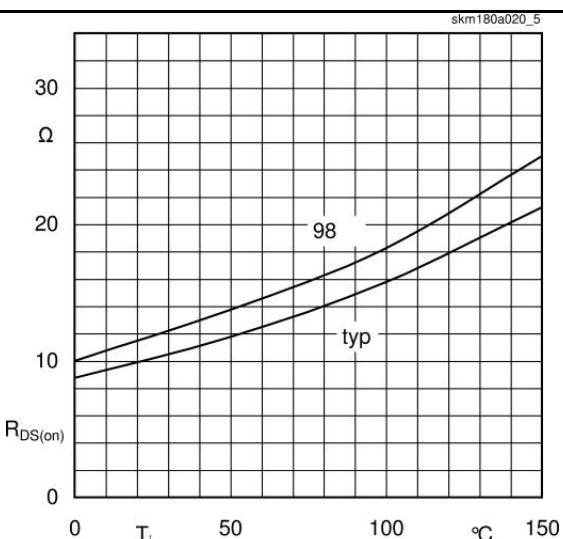


Fig. 5 On-resistance vs. temperature

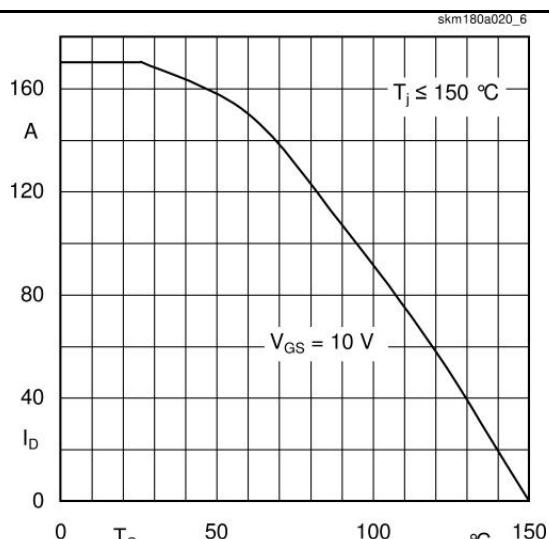


Fig. 6 Rated current vs. temperature

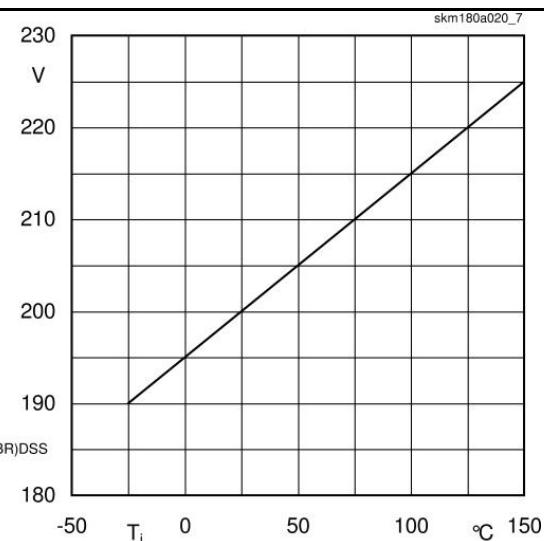


Fig. 7 Breakdown voltage vs. temperature

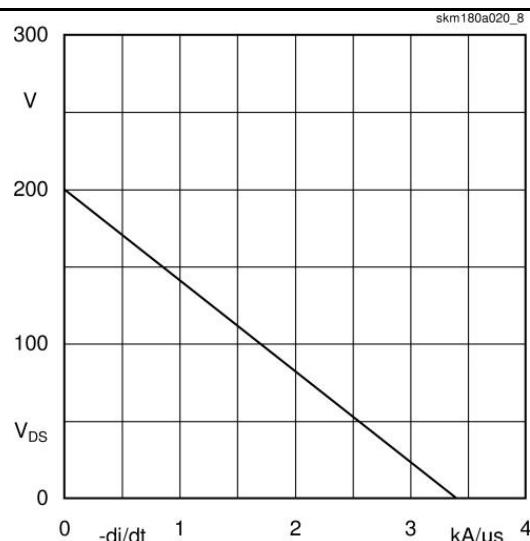


Fig. 8 Drain-source voltage derating

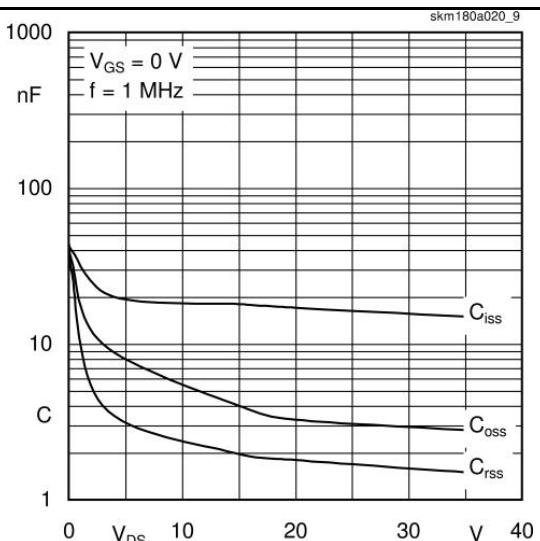


Fig. 9 Capacitances vs. drain-source voltage

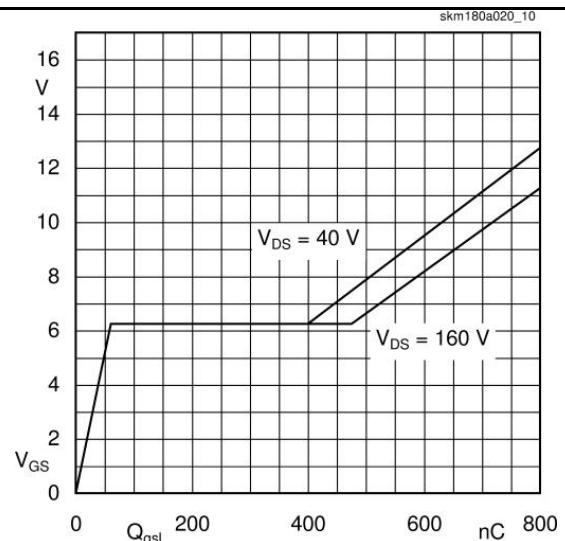


Fig. 10 Gate charge characteristic

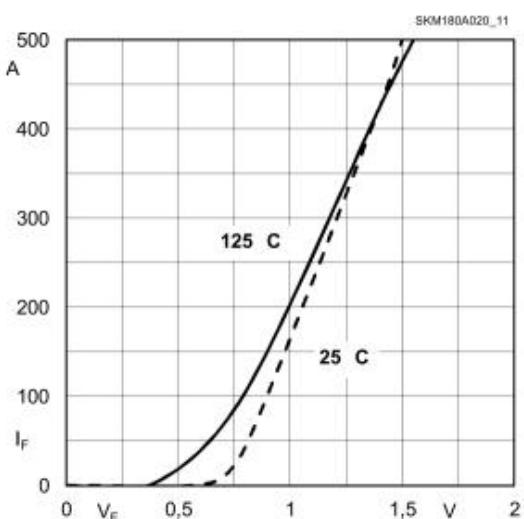


Fig. 11 Diode forward characteristic, t_p = 80 μs

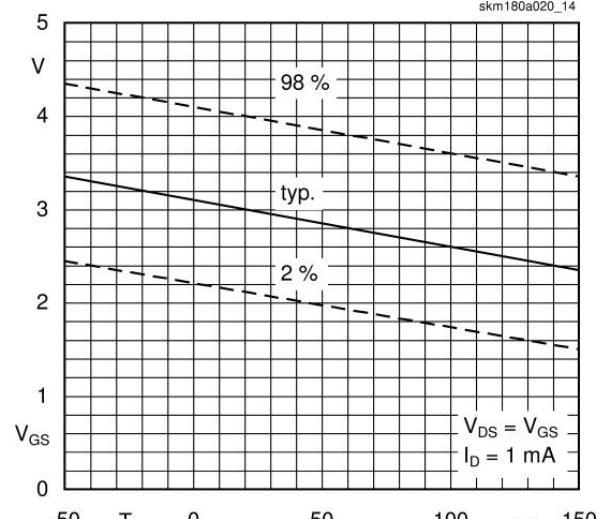
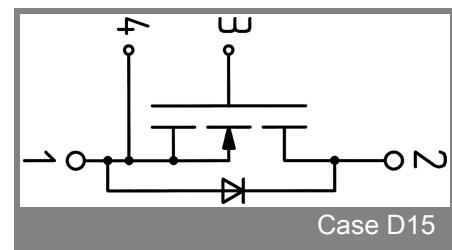
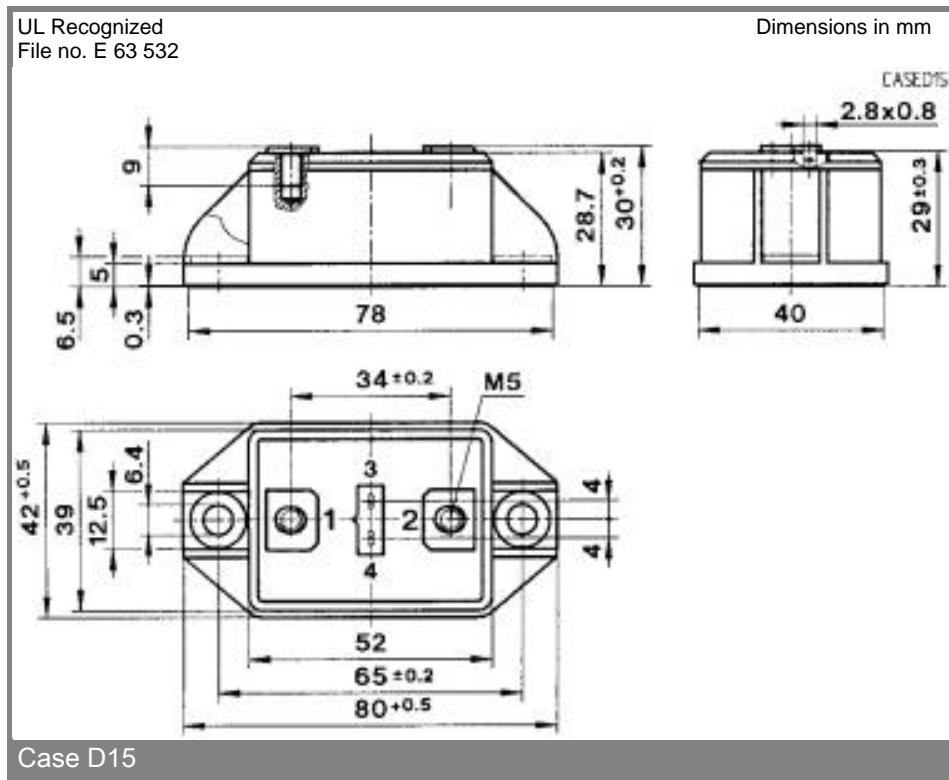


Fig. 14 Gate-source threshold voltage

UL Recognized
File no. E 63 532



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

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our staff.