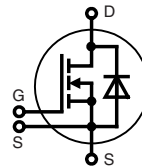


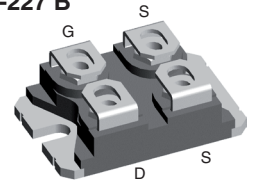
# CoolMOS™ 1) Power MOSFET

N-Channel Enhancement Mode  
Low  $R_{DS(on)}$ , High  $V_{DSS}$  MOSFET

$V_{DSS} = 600\text{ V}$   
 $I_{D25} = 75\text{ A}$   
 $R_{DS(on) \text{ max}} = 36\text{ m}\Omega$



miniBLOC, SOT-227 B



G = Gate    D = Drain    S = Source

Either source terminal at miniBLOC can be used as main or kelvin source

MOSFET			
Symbol	Conditions	Maximum Ratings	
$V_{DSS}$	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	600	V
$V_{GS}$		$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	75	A
$I_{D90}$	$T_C = 90^\circ\text{C}$	50	A
$I_{D \text{ puls}}$	pulse drain current, $t_p$ limited by $T_{Jmax}$	250	A
$E_{AS}$	$I_D = 10\text{ A}; L = 36\text{ mH}$	$T_C = 25^\circ\text{C}$	1.8 J
$E_{AR}$	$I_D = 20\text{ A}; L = 5\text{ mH}$	$T_C = 25^\circ\text{C}$	1 mJ
$dv/dt$	$V_{DS} < V_{DSS}; I_F \leq 100\text{ A}$ $ di_F/dt  \leq 100\text{ A}/\mu\text{s}$	$T_{VJ} = 125^\circ\text{C}$	6 V/ns

## Features

- miniBLOC package
  - Electrically isolated copper base
  - Low coupling capacitance to the heatsink for reduced EMI
  - High power dissipation due to AlN ceramic substrate
  - International standard package SOT-227
  - Easy screw assembly
- fast CoolMOS™ 1) power MOSFET 3<sup>rd</sup> generation
  - High blocking capability
  - Low on resistance
  - Avalanche rated for unclamped inductive switching (UIS)
  - Low thermal resistance due to reduced chip thickness
- Enhanced total power density

Symbol	Conditions	Characteristic Values			
		$(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$			
		min.	typ.	max.	
$R_{DS(on)}$	$V_{GS} = 10\text{ V}; I_D = I_{D90}$		30	36	m $\Omega$
$V_{GS(th)}$	$V_{DS} = 20\text{ V}; I_D = 5\text{ mA}$	2.1		3.9	V
$I_{DSS}$	$V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}$			50	$\mu\text{A}$
			100		$\mu\text{A}$
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$			$\pm 200$	nA
$Q_g$	$V_{GS} = 0\text{ to } 10\text{ V}; V_{DS} = 350\text{ V}; I_D = 100\text{ A}$		500		nC
$Q_{gs}$			50		nC
$Q_{gd}$			240		nC
$t_{d(on)}$	$V_{GS} = 10\text{ V}; V_{DS} = 380\text{ V}$ $I_D = 100\text{ A}; R_G = 1.0\ \Omega$		20		ns
$t_r$			30		ns
$t_{d(off)}$			110		ns
$t_f$			10		ns
$V_F$	(reverse conduction) $I_F = 37.5\text{ A}; V_{GS} = 0\text{ V}$		0.9	1.1	V
$R_{thJC}$			0.22		K/W

## Applications

- Switched mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)
- Power factor correction (PFC)
- Welding
- Inductive heating

<sup>1)</sup> CoolMOS™ is a trademark of Infineon Technologies AG.

### Source-Drain Diode

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
$I_S$	$V_{GS} = 0\text{ V}$			85	A
$I_{SM}$				250	A
$V_{SD}$	$I_F = 85\text{ A}; V_{GS} = 0\text{ V}$			1.2	V
$t_{rr}$	$I_F = 85\text{ A}; -di_F/dt = 200\text{ A}/\mu\text{s}; V_R = 350\text{ V}$		580		ns
$Q_{RM}$			46		$\mu\text{C}$
$I_{RM}$			140		A

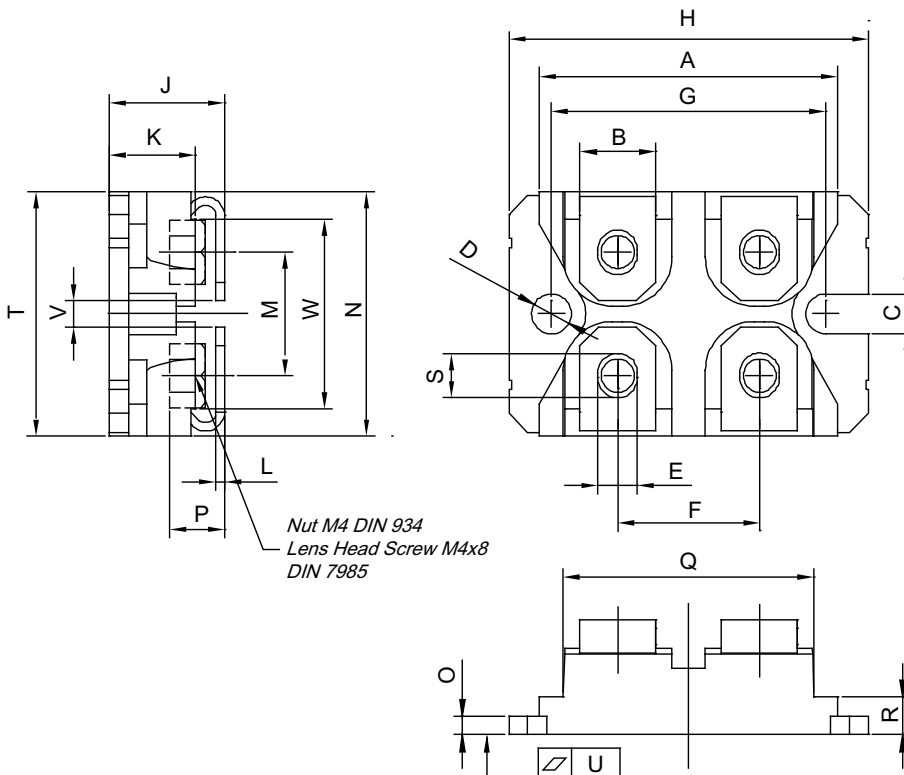
( $T_{VJ} = 25^\circ\text{C}$ , unless otherwise specified)

### Component

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$	operating	-55...+150	$^\circ\text{C}$
$T_{stg}$		-55...+125	$^\circ\text{C}$
$M_d$	mounting torque	1.5	Nm
	terminal connection torque (M4)	1.5	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{thCH}$	with heatsink compound		0.1	K/W
Weight			30	g

### miniBLOC, SOT-227 B Outline



SYM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	31.50	31.88	1.240	1.255
B	7.80	8.20	.307	.323
C	4.09	4.29	.161	.169
D	4.09	4.29	.161	.169
E	4.09	4.29	.161	.169
F	14.91	15.11	.587	.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.489	1.505
J	11.68	12.22	.460	.481
K	8.92	9.60	.351	.378
L	0.76	0.84	.030	.033
M	12.60	12.85	.496	.506
N	25.15	25.42	.990	1.001
O	1.98	2.13	.078	.084
P	4.95	5.97	.195	.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	.155	.174
S	4.72	4.85	.186	.191
T	24.59	25.07	.968	.987
U	-.05	.10	-.002	.004
V	3.30	4.57	.130	.180
W	19.81	21.08	.780	.830

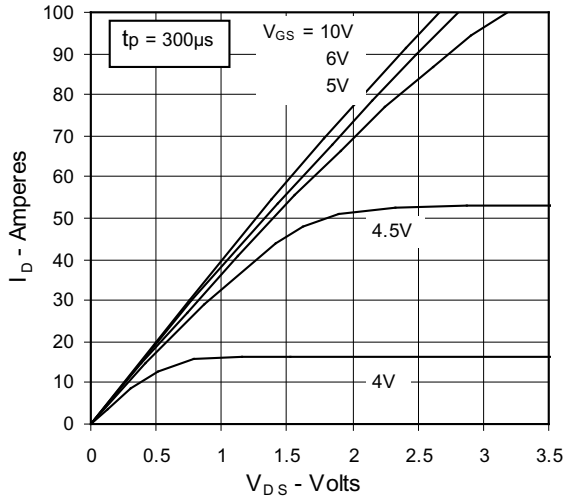


Fig. 1 Typ. output characteristics  $I_D = f(V_{DS})$

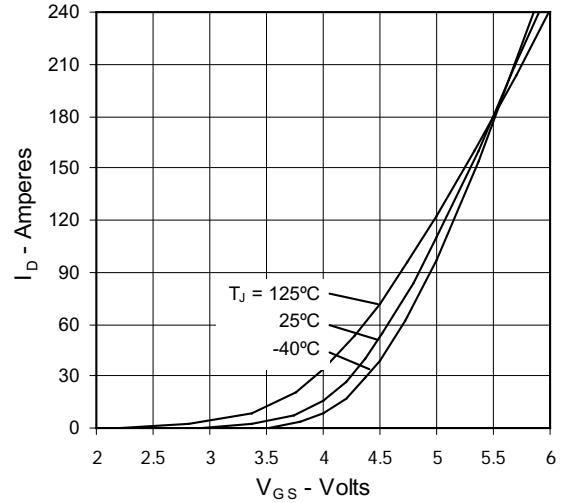


Fig. 2 Typ. transfer characteristics  $I_D = f(V_{GS})$

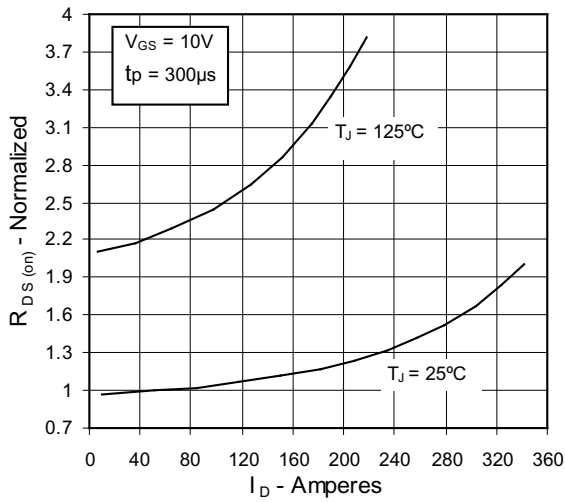


Fig. 3 Typical normalized  $R_{DS(on)} = f(I_D)$

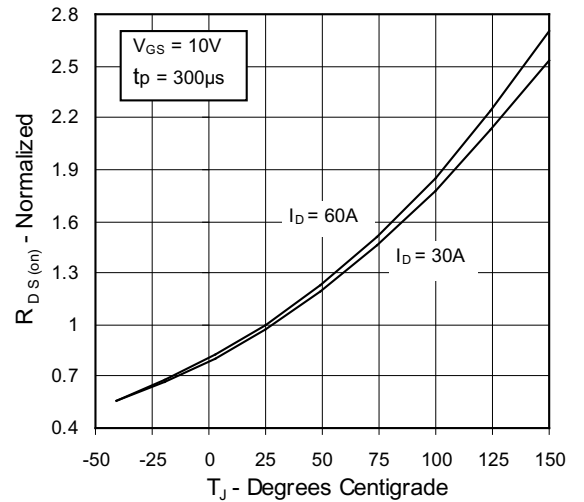


Fig. 4 Typical normalized  $R_{DS(on)} = f(T_J)$

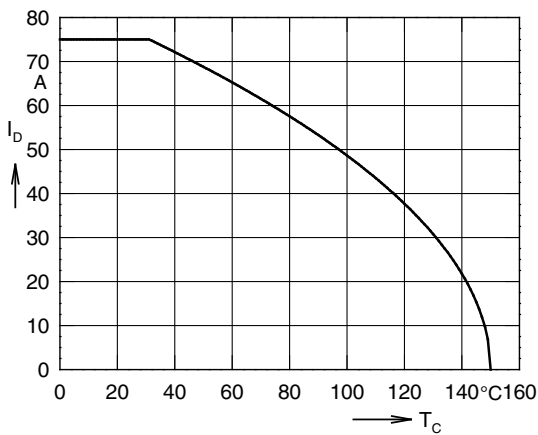


Fig. 5 Continuous drain current  $I_D = f(T_C)$

Fig. 6 Typ. normalized  $V_{DSS} = f(T_J)$ ,  $V_{GS(th)} = f(T_J)$

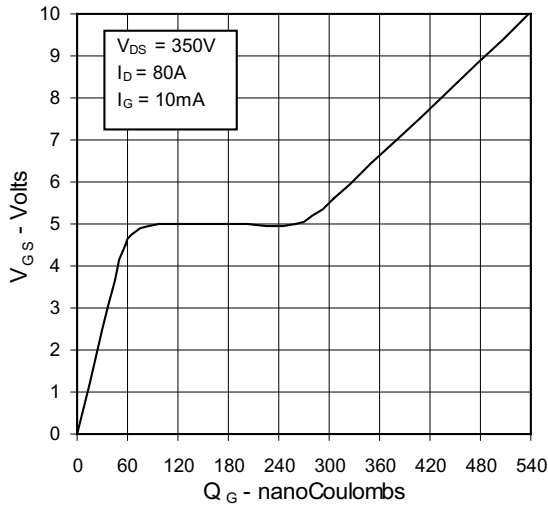


Fig. 7 Typ. turn-on gate charge characteristics

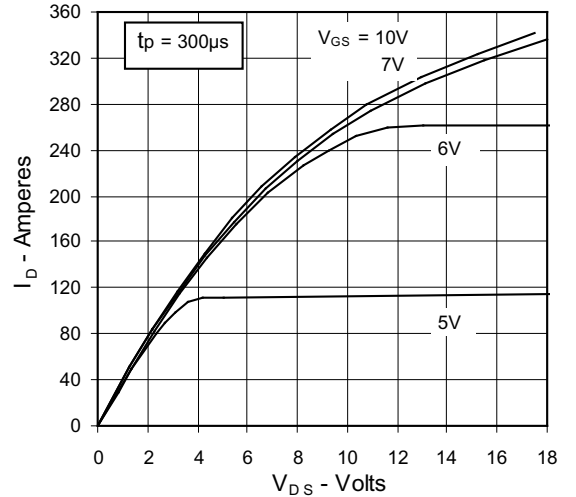


Fig. 8 Forward Safe Operating Area,  $I_D = f(V_{DS})$

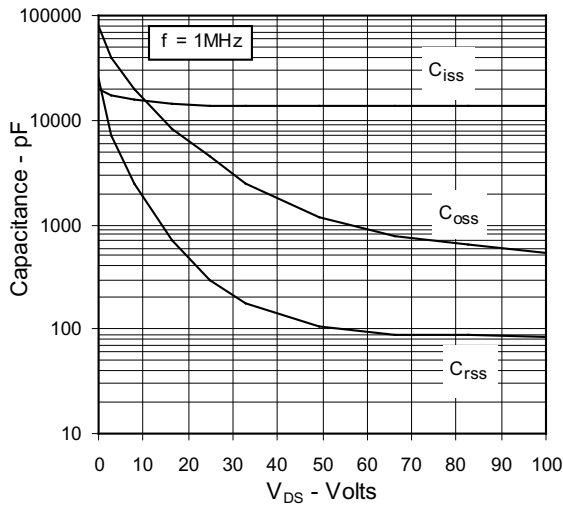


Fig. 9 Typ. capacitances  $C = f(V_{DS})$ ,  $f = 1 \text{ MHz}$

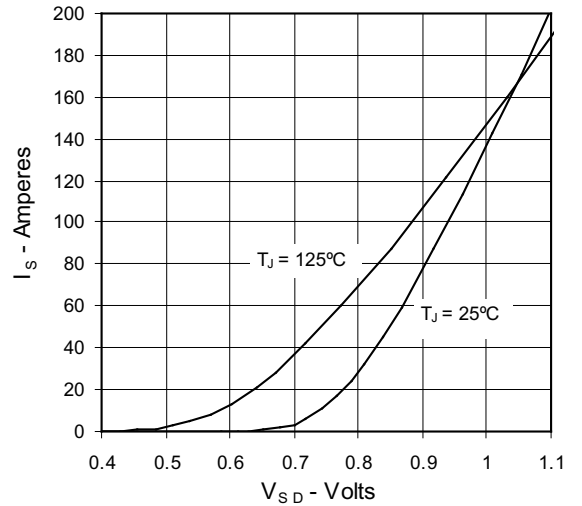


Fig. 10 Typ. forward characteristics of reverse diode,  $I_S = f(V_{SD})$

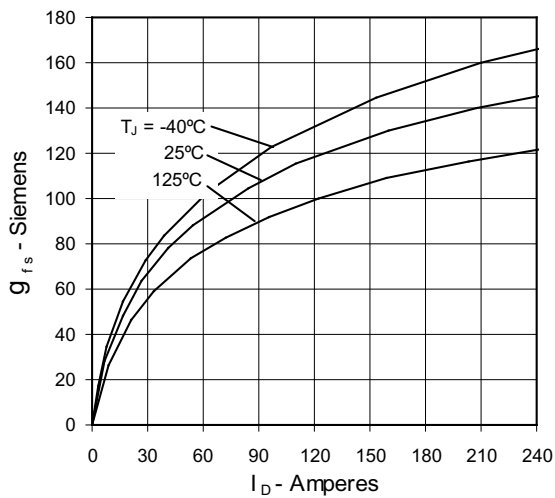


Fig. 11 Typical transconductance  $g_{fs} = f(I_D)$

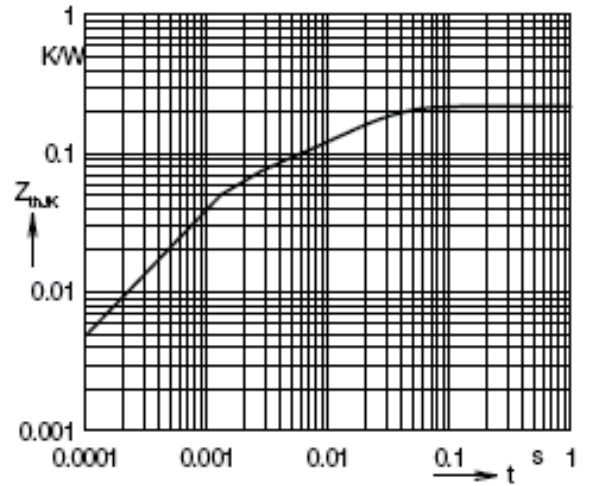


Fig. 12 Transient thermal resistance  $Z_{thJK} = f(t_p)$