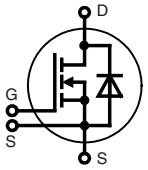
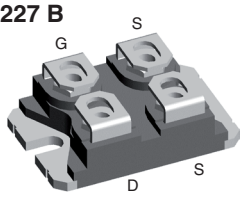
CoolMOS™ [1] Power MOSFET

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

N-Channel Enhancement Mode
Low R_{DSon}, High V_{DSS} MOSFET



miniBLOC, SOT-227 B



G = Gate D = Drain S = Source
Either source terminal at miniBLOC can be used as main or kelvin source

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 3rd 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

Applications

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

[1] CoolMOS™ is a trademark of Infineon Technologies AG.

MOSFET

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

Symbol	Conditions		Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
R_{DSon}	V_{GS} = 10 V; $I_D = I_{D90}$			30	36	mΩ
$V_{GS(th)}$	V_{DS} = 20 V; I_D = 5 mA		2.1		3.9	V
I_{DSS}	$V_{DS} = V_{DSS}$; V_{GS} = 0 V	T_{VJ} = 25°C			50	µA
		T_{VJ} = 125°C		100		µA
I_{GSS}	V_{GS} = ± 20 V; V_{DS} = 0 V				±200	nA
Q_g	V_{GS} = 0 to 10 V; V_{DS} = 350 V; I_D = 100 A			500		nC
Q_{gs}				50		nC
Q_{gd}				240		nC
$t_{d(on)}$	V_{GS} = 10 V; V_{DS} = 380 V I_D = 100 A; R_G = 1.0 Ω			20		ns
t_r				30		ns
$t_{d(off)}$				110		ns
t_f				10		ns
V_F	(reverse conduction) I_F = 37.5 A; V_{GS} = 0 V			0.9	1.1	V
R_{thJC}					0.22	K/W

Source-Drain Diode

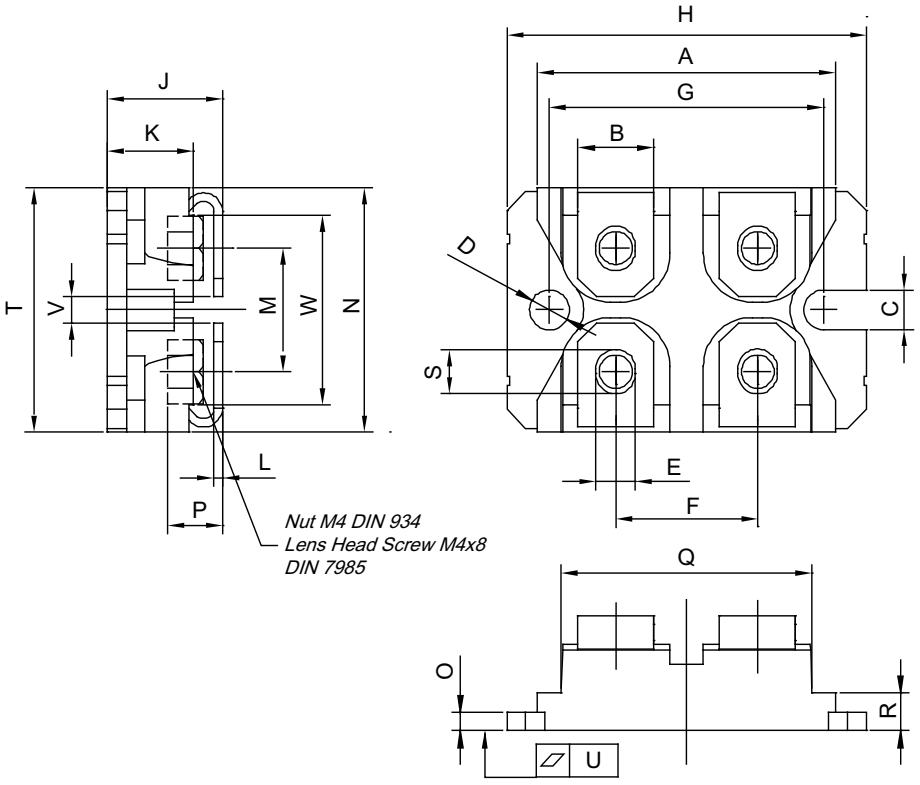
Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			85	A
I_{SM}				250	A
V_{SD}	I_F = 85 A; V_{GS} = 0 V			1.2	V
t_{rr}	I_F = 85 A; -di_F/dt = 200 A/µs; V_R = 350 V		580		ns
Q_{RM}			46		µC
I_{RM}			140		A

Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-55...+150	°C
T_{stg}		-55...+125	°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 MIN	MAX	INCHES 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

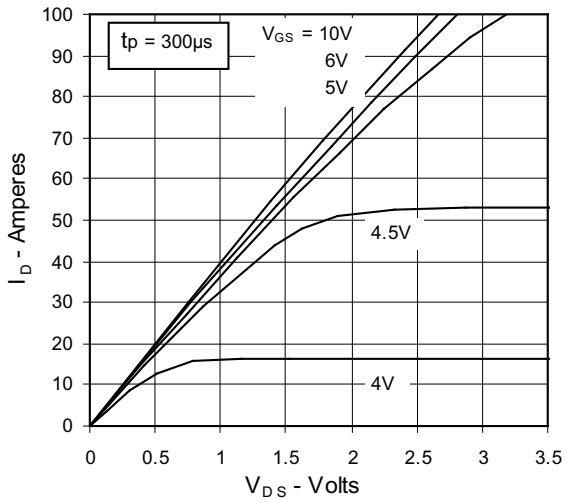


Fig. 1 Typ. output characteristics $I_D = f(V_{DS})$

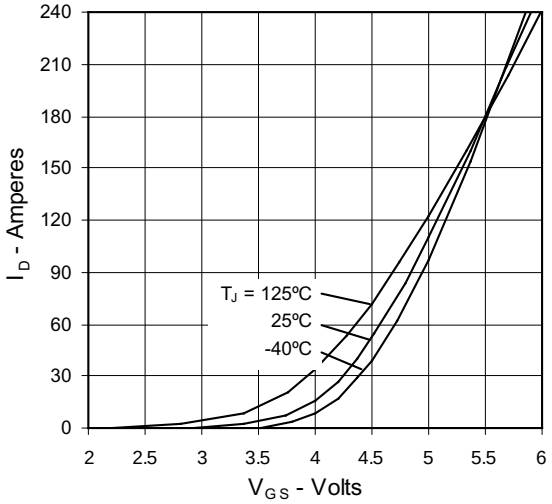


Fig. 2 Typ. transfer characteristics $I_D = f(V_{GS})$

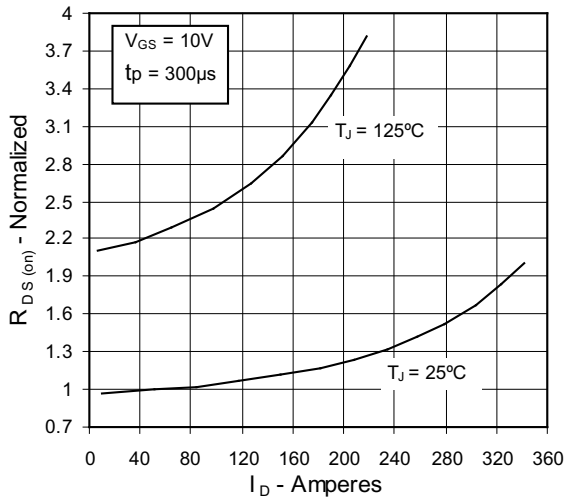


Fig. 3 Typical normalized $R_{DS(on)} = f(I_D)$

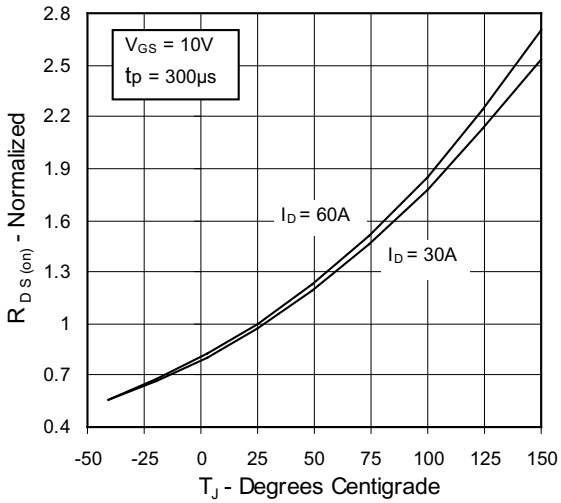


Fig. 4 Typical normalized $R_{DS(on)} = f(T_J)$

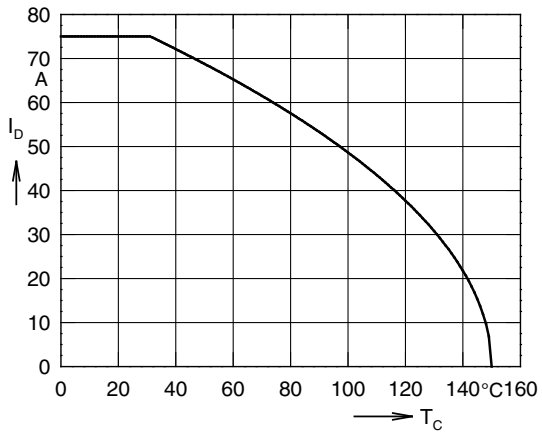


Fig. 5 Continuous drain current $I_D = f(T_C)$

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

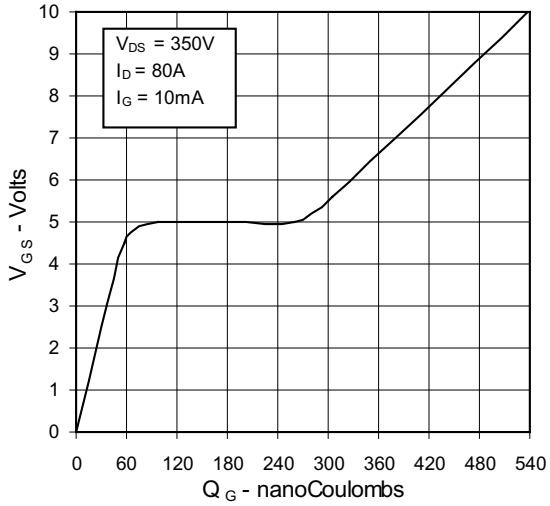


Fig. 7 Typ. turn-on gate charge characteristics

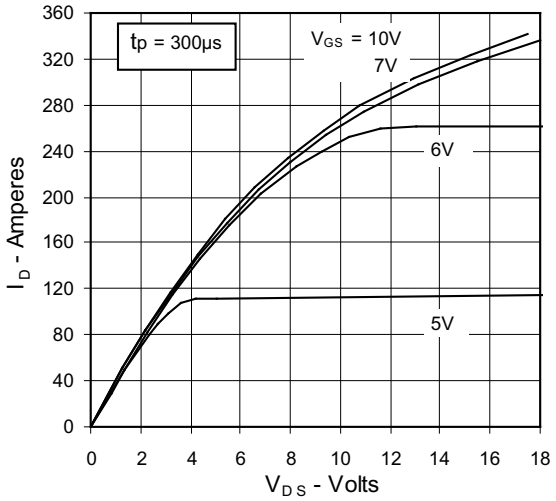


Fig. 8 Forward Safe Operating Area, $I_D = f(V_{DS})$

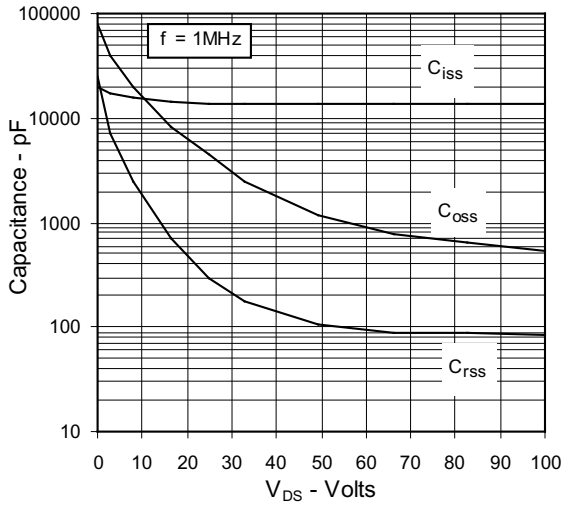


Fig. 9 Typ. capacitances $C = f(V_{DS})$, f = 1 MHz

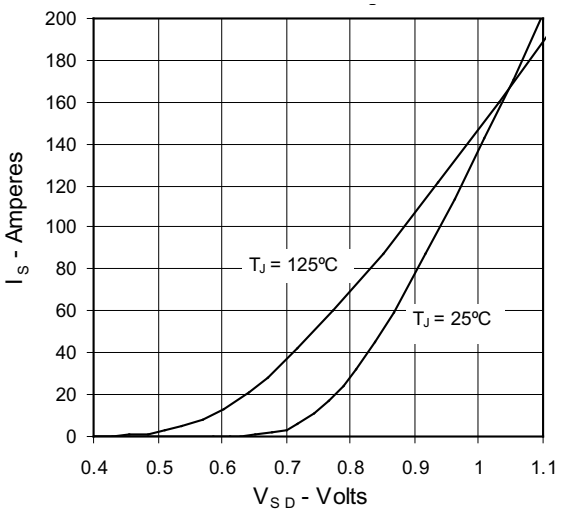


Fig. 10 Typ. forward characteristics of reverse diode, $I_S = f(V_{SD})$

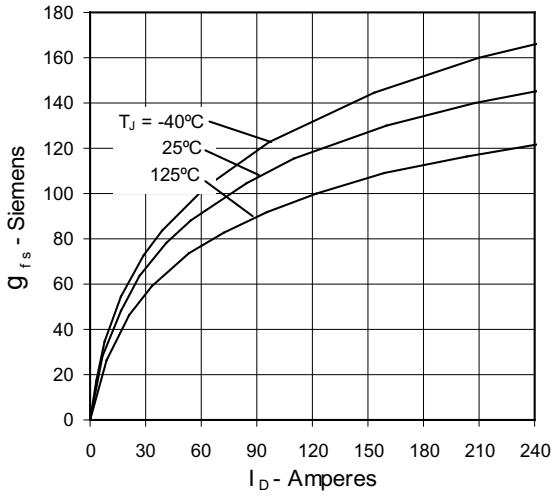


Fig. 11 Typical transconductance $gfs = f(I_D)$

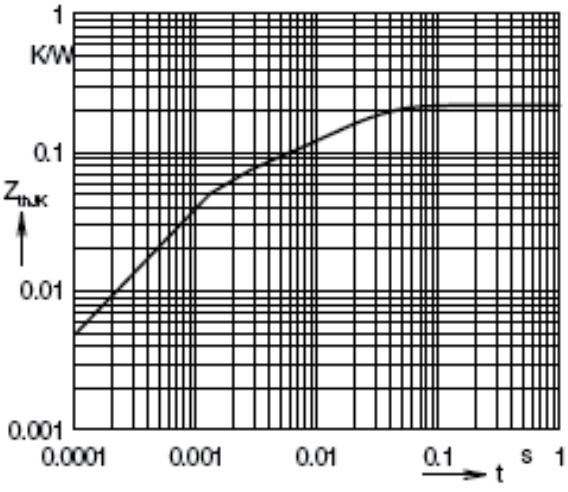


Fig. 12 Transient thermal resistance $Z_{thJK} = f(tp)$