□ IXYS

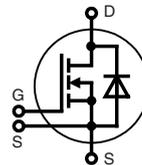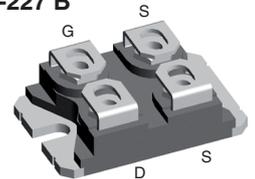# CoolMOS™ [1] Power MOSFET

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

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

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 $\mid di_F/dt \mid \leq$ 100A/μs	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				500		nC
Q_{gs}	V_{GS} = 0 to 10 V; V_{DS} = 350 V; I_D = 100 A			50		nC
Q_{gd}				240		nC
$t_{d(on)}$				20		ns
t_r	V_{GS} = 10 V; V_{DS} = 380 V			30		ns
$t_{d(off)}$	I_D = 100 A; R_G = 1.0 Ω			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

IXYS reserves the right to change limits, test conditions and dimensions.

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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}			580		ns
Q_{RM}	I_F = 85 A; -di_F/dt = 200 A/µs; V_R = 350 V		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
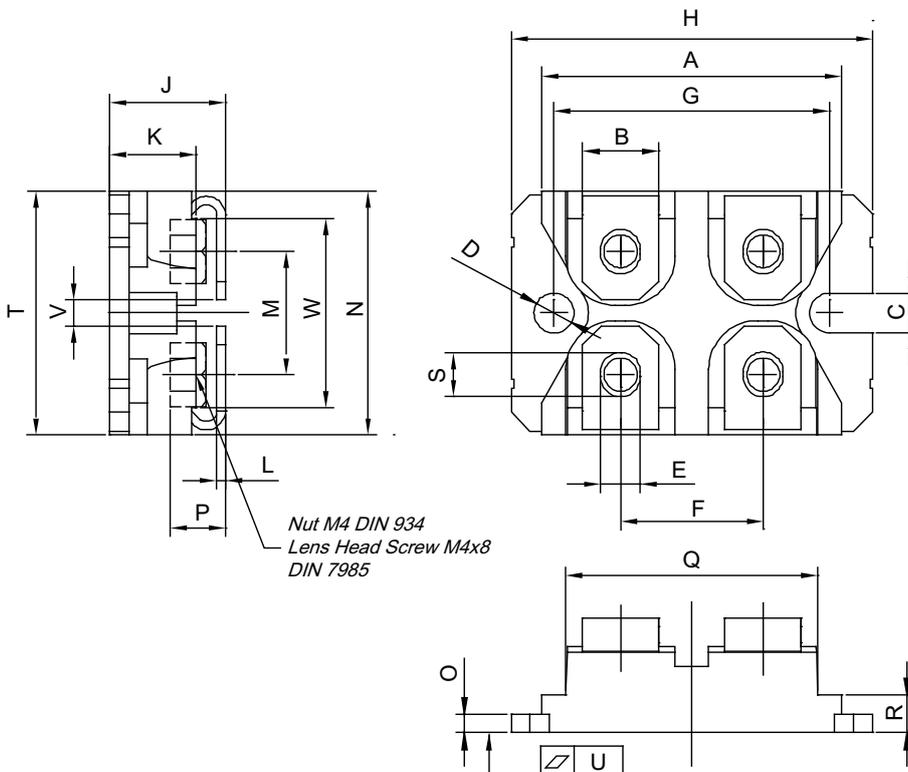
SYM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	31.50	31.88	1.240	1.255
B	7.80	8.20	.307	.323
C	4.09	4.29	.161	.169
D	4.09	4.29	.161	.169
E	4.09	4.29	.161	.169
F	14.91	15.11	.587	.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.489	1.505
J	11.68	12.22	.460	.481
K	8.92	9.60	.351	.378
L	0.76	0.84	.030	.033
M	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

Nut M4 DIN 934
Lens Head Screw M4x8 DIN 7985

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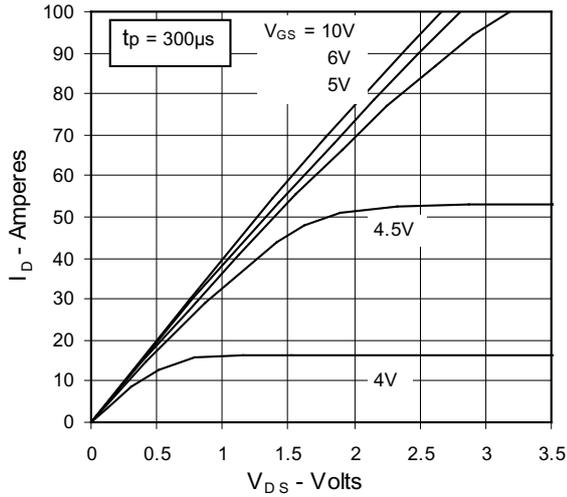
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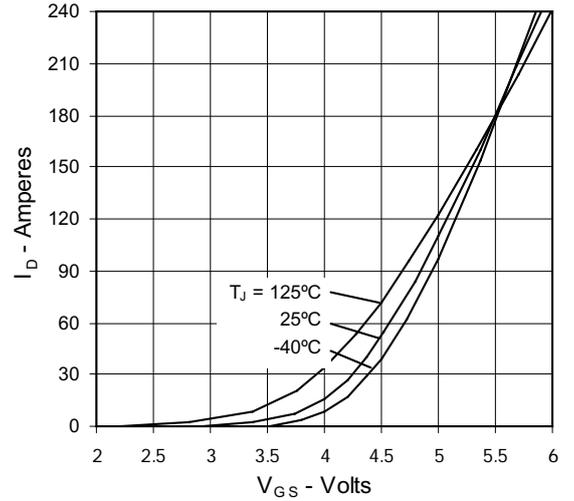Fig. 1   Typ. output characteristics $I_D = f (V_{DS})$

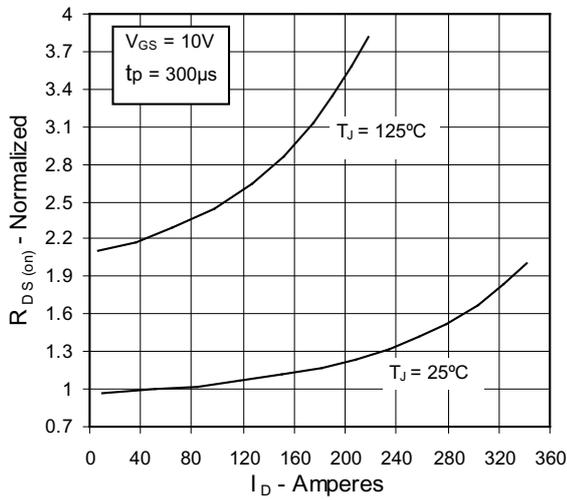Fig. 2   Typ. transfer characteristics $I_D = f (V_{GS})$
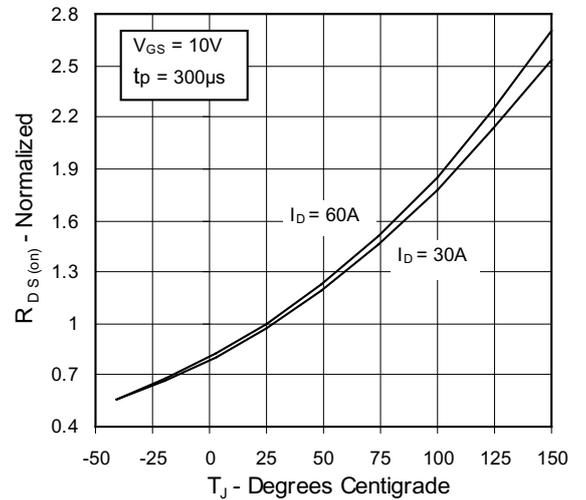

Fig. 3   Typical normalized $R_{DS(on)} = f (I_D)$

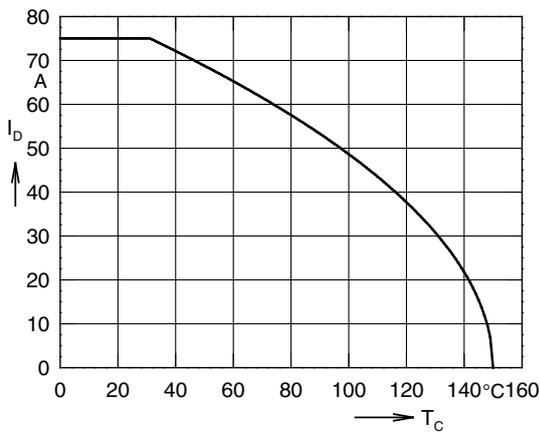Fig. 4   Typical normalized $R_{DS(on)} = f (T_J)$

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

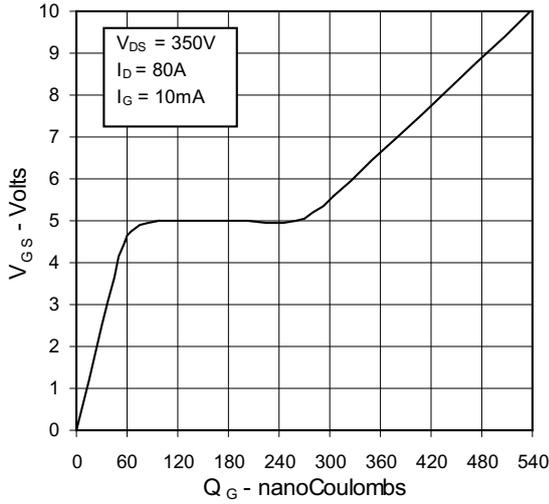Fig. 6   Typ. normalized $V_{DSS} = f (T_J), V_{GS(th)} = f (T_J)$

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Fig. 7 Typ. turn-on gate charge characteristics
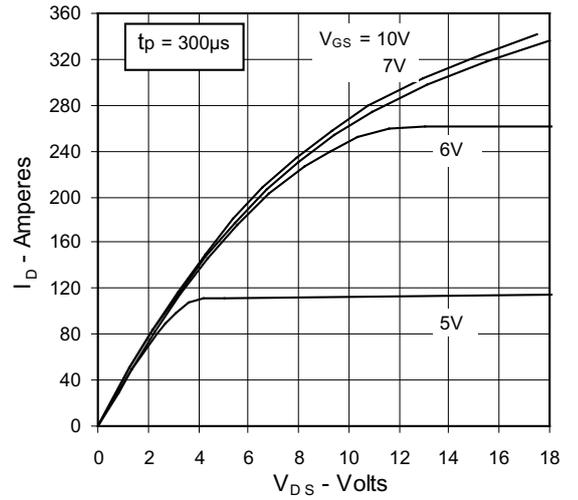
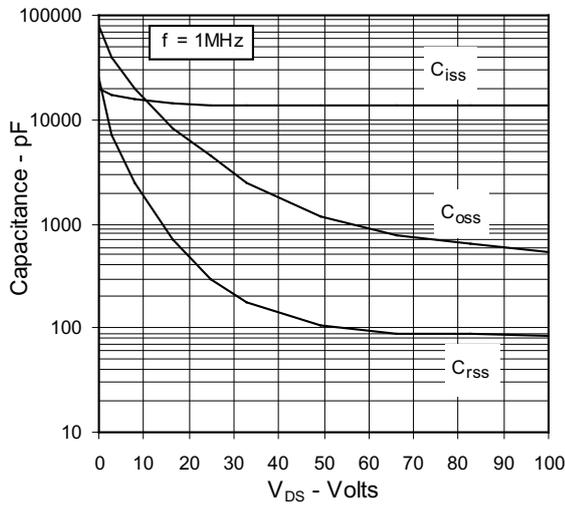
Fig. 8 Forward Safe Operating Area, $I_D = f (V_{DS})$

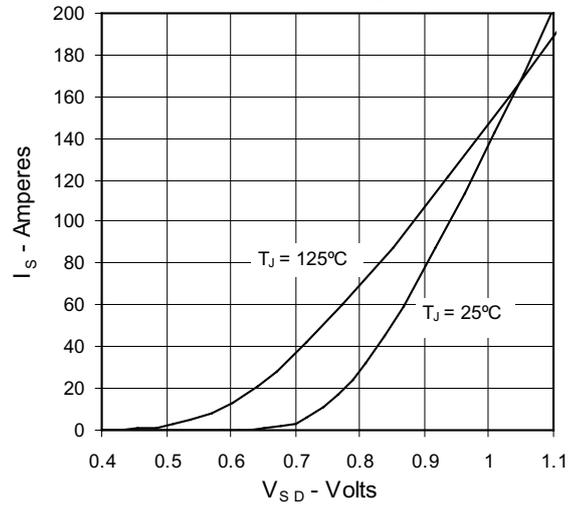Fig. 9 Typ. capacitances $C = f (V_{DS})$, f = 1 MHz

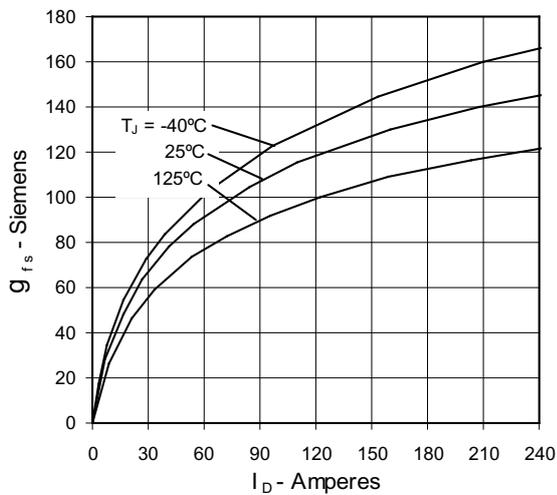Fig. 10 Typ. forward characteristics of reverse diode, $I_S = f (V_{SD})$
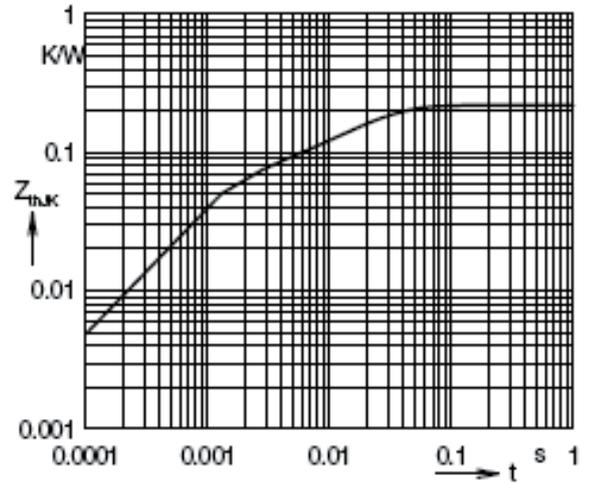

Fig. 11 Typical transconductance gfs = f (I_D)

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

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