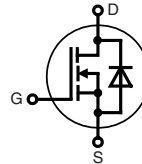
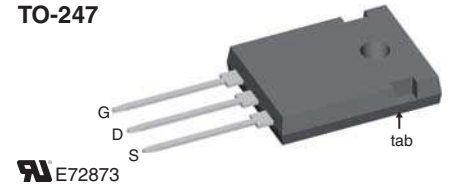


# CoolMOS™ 1) Power MOSFET

Low  $R_{DS(on)}$ , high  $V_{DSS}$   
Superjunction MOSFET

$V_{DSS} = 600\text{ V}$   
 $I_{D25} = 47\text{ A}$   
 $R_{DS(on) \text{ max}} = 70\text{ m}\Omega$


**TO-247**


MOSFET			
Symbol	Conditions	Maximum Ratings	
$V_{DSS}$	$T_{VJ} = 25^\circ\text{C}$	600	V
$V_{GS}$		$\pm 20$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	47	A
$I_{D100}$	$T_C = 100^\circ\text{C}$	30	A
$E_{AS}$	single pulse $I_D = 10\text{ A}; T_C = 25^\circ\text{C}$	1800	mJ
$E_{AR}$	repetitive $I_D = 20\text{ A}; T_C = 25^\circ\text{C}$	tbd	mJ
$dV/dt$	MOSFET $dV/dt$ ruggedness $V_{DS} = 0 \dots 480\text{ V}$	tbd	V/ns

**Features**

- 3rd generation Superjunction power MOSFET
- high blocking capability
- lowest resistance
- avalanche rated for unclamped inductive switching (UIS)
- low thermal resistance due to reduced chip thickness

**Applications**

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

Symbol	Conditions	Characteristic Values			
		$(T_{VJ} = 25^\circ\text{C}, \text{ unless otherwise specified})$			
		min.	typ.	max.	
$R_{DS(on)}$	$V_{GS} = 10\text{ V}; I_D = I_{D100} \text{ }^{\textcircled{1}}$		60	70	m $\Omega$
$V_{GS(th)}$	$V_{DS} = V_{GS}; I_D = 2\text{ mA}$	2		4	V
$I_{DSS}$	$V_{DS} = V_{DSS}; V_{GS} = 0\text{ V}$			25	$\mu\text{A}$
				250	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$			$\pm 100$	nA
$C_{iss}$	} $V_{GS} = 0\text{ V}; V_{DS} = 100\text{ V}$ $f = 1\text{ MHz}$		tbd		pF
$C_{oss}$				tbd	
$Q_g$	} $V_{GS} = 0\text{ to }10\text{ V}; V_{DS} = 350\text{ V}; I_D = 40\text{ A}$		255	650	nC
$Q_{gs}$			30		nC
$Q_{gd}$			110		nC
$t_{d(on)}$	} $V_{GS} = 10\text{ V}; V_{DS} = 380\text{ V}$ $I_D = 47\text{ A}; R_G = 4.7\ \Omega$		20		ns
$t_r$			27		ns
$t_{d(off)}$			111		ns
$t_f$			10		ns
$R_{thJC}$			0.3		K/W

<sup>①</sup> Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$

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

**Source-Drain Diode**

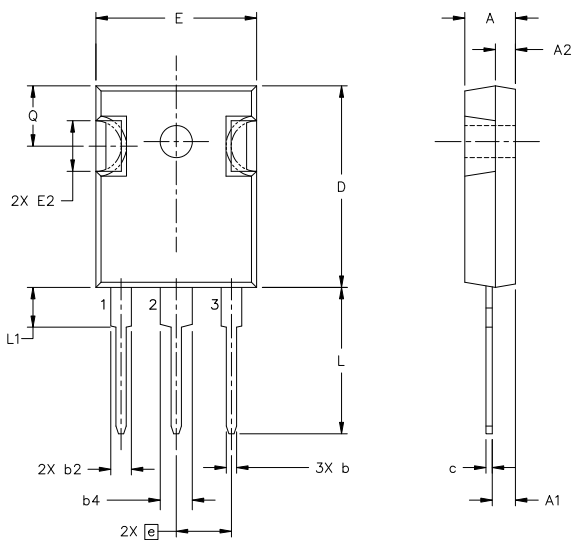
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$			A
$V_{SD}$	$I_F = 40\text{ A}; V_{GS} = 0\text{ V}$			V
$t_{rr}$ $Q_{RM}$ $I_{RM}$	} $I_F = 40\text{ A}; -di_F/dt = 100\text{ A}/\mu\text{s}; V_R = 640\text{ V}$			ns $\mu\text{C}$ A

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

**Component**

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$	operating	-55...+150	$^\circ\text{C}$
$T_{stg}$		-55...+150	$^\circ\text{C}$
$M_d$	mounting torque	1.13	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{thCH}$	with heatsink compound		tdb	K/W
Weight			2.7	g

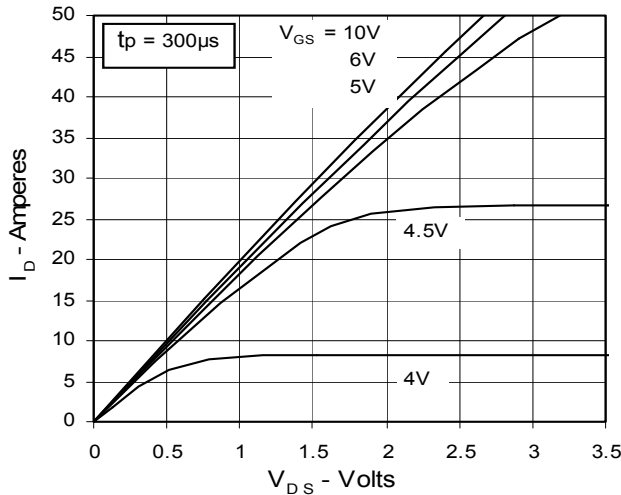
**TO-247 Outline**


Symbol	Inches		Millimeters	
	min	max	min	max
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215 BSC		5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
$\emptyset P$	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
$\emptyset P1$	-	0.291	-	7.39

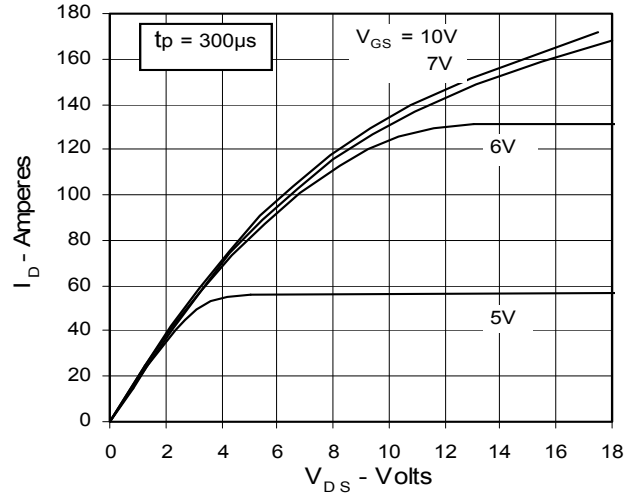
IXYS reserves the right to change limits, test conditions and dimensions.

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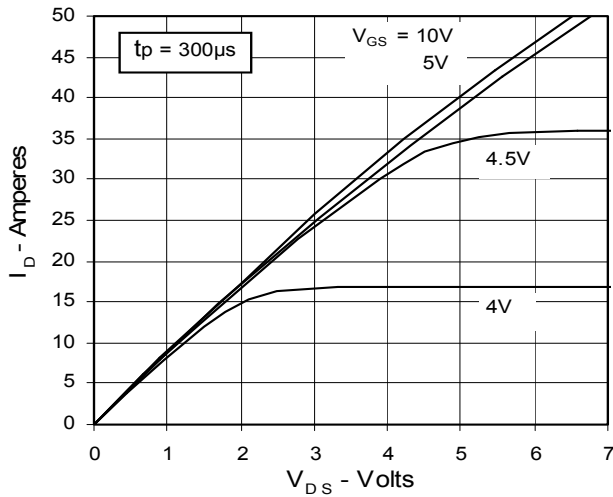
**Fig. 1. Output Characteristics @ 25 Deg. C**



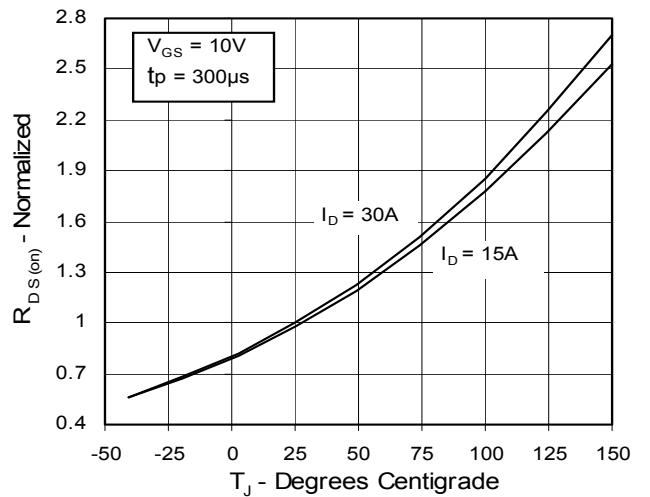
**Fig. 2. Extended Output Characteristics @ 25 deg. C**



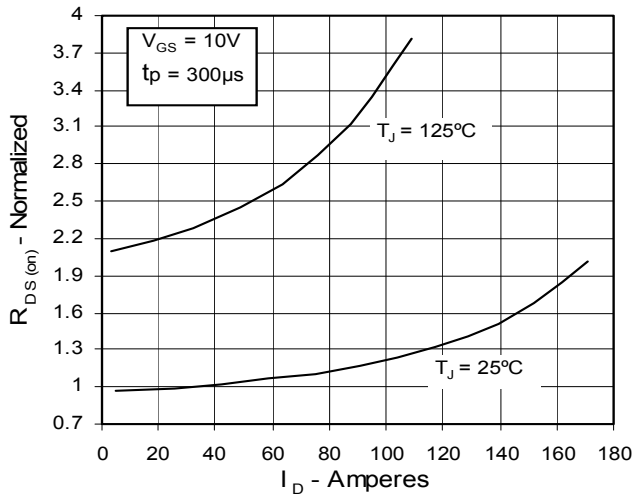
**Fig. 3. Output Characteristics @ 125 Deg. C**



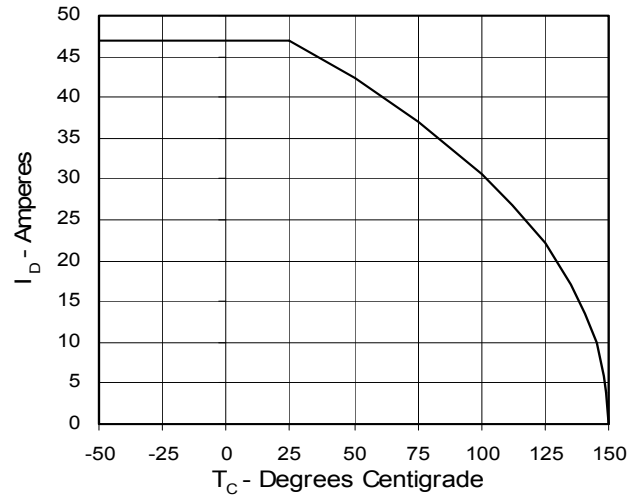
**Fig. 4. R\_DS(on) Normalized to I\_D100 Value vs. Junction Temperature**



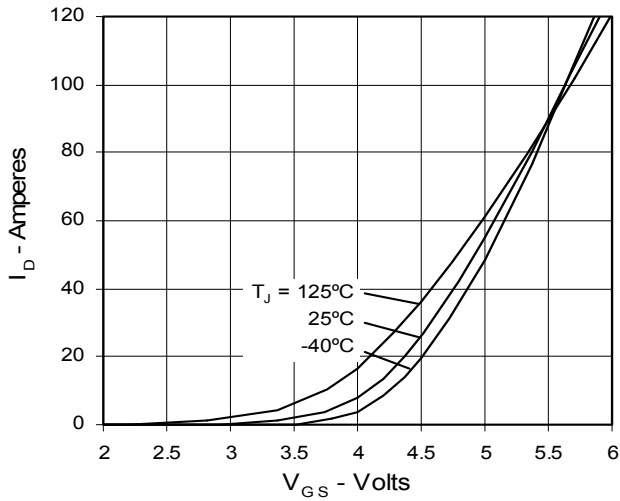
**Fig. 5. R\_DS(on) Normalized to I\_D100 Value vs. I\_D**



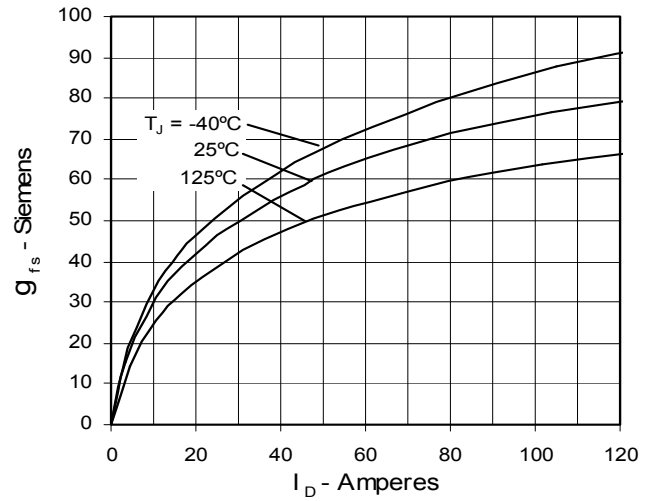
**Fig. 6. Drain Current vs. Case Temperature**



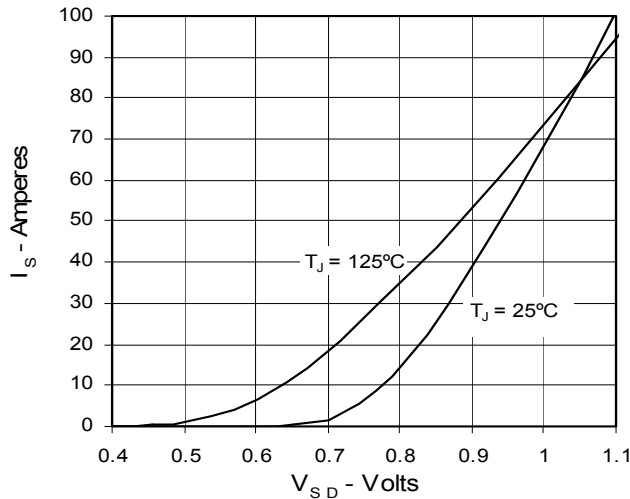
**Fig. 7. Input Admittance**



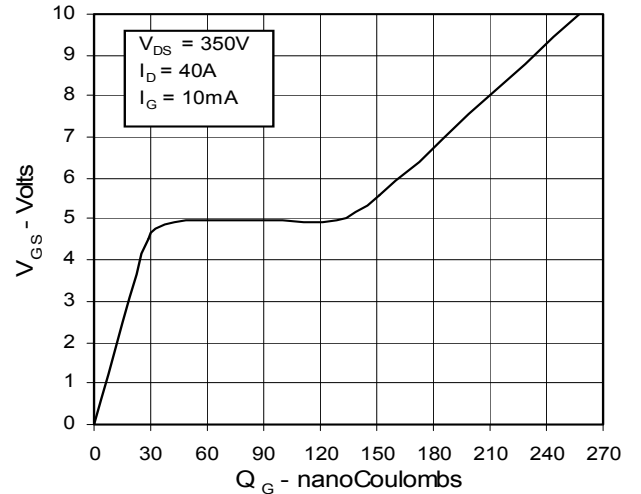
**Fig. 8. Transconductance**



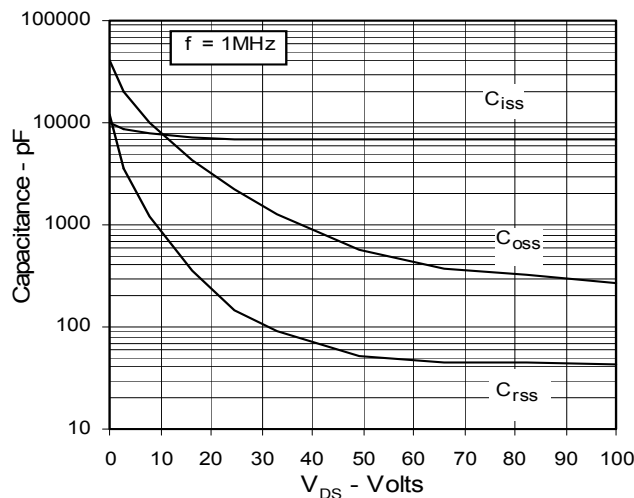
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Maximum Transient Thermal Resistance**

