# ⌐IXYS

CoolMOS™ [1] Power MOSFET

N-Channel Enhancement Mode
Low R_{DSon}, High V_{DSS} MOSFET
Ultra low gate charge

I_{D25} $=$ $70\,A$
V_{DSS} $=$ $600\,V$
$R_{DS(on)\,max}$ $= 0.045\,\Omega$
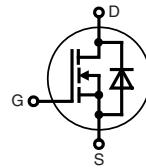
TO-247 AD (IXKH)
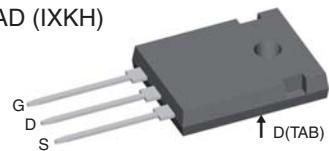
MOSFET		
Symbol	**Conditions**	**Maximum Ratings**
V_{DSS}	$T_{VJ} = 25°C$	600 V
V_{GS}		± 20 V
I_{D25}	$T_C = 25°C$	70 A
I_{D90}	$T_C = 90°C$	48 A
E_{AS}	single pulse } $I_D = 11$ A; $T_C = 25°C$	1950 mJ
E_{AR}	repetitive	3 mJ
dV/dt	MOSFET dV/dt ruggedness $V_{DS} = 0...480$ V	50 V/ns

Symbol	Conditions	Characteristic Values			
		($T_{VJ} = 25°C$, unless otherwise specified)			
		min.	typ.	max.	
R_{DSon}	$V_{GS} = 10$ V; $I_D = 44$ A		40	45	mΩ
$V_{GS(th)}$	$V_{DS} = V_{GS}$; $I_D = 3$ mA	2.5	3	3.5	V
I_{DSS}	$V_{DS} = 600$ V; $V_{GS} = 0$ V $T_{VJ} = 25°C$			10	µA
	$T_{VJ} = 125°C$		50		µA
I_{GSS}	$V_{GS} = ± 20$ V; $V_{DS} = 0$ V			100	nA
C_{iss}	$V_{GS} = 0$ V; $V_{DS} = 100$ V } f = 1 MHz		6800		pF
C_{oss}			320		pF
Q_g			150	190	nC
Q_{gs}	$V_{GS} = 0$ to 10 V; $V_{DS} = 400$ V; $I_D = 44$ A		35		nC
Q_{gd}			50		nC
$t_{d(on)}$			30		ns
t_r	$V_{GS} = 10$ V; $V_{DS} = 400$ V		20		ns
$t_{d(off)}$	$I_D = 44$ A; $R_G = 3.3\ \Omega$		100		ns
t_f			10		ns
R_{thJC}				0.2	K/W

Features

- fast CoolMOS™ [1] power MOSFET
  4th generation
  - High blocking capability
  - Lowest 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
- PDP and LCD adapter

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

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

20090209d

Source-Drain Diode

Symbol	Conditions	Characteristic Values			
		(T_{VJ} = 25°C, unless otherwise specified)			
		min.	typ.	max.	
I_S	V_{GS} = 0 V			44	A
V_{SD}	I_F = 44 A; V_{GS} = 0 V		0.9	1.2	V
t_{rr}			600		ns
Q_{RM}	I_F = 44 A; -di_F/dt = 100 A/µs; V_R = 400 V		17		µC
I_{RM}			60		A

Component

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-55...+150	°C
T_{stg}		-55...+150	°C
M_d	mounting torque	0.8 ... 1.2	Nm

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
R_{thCH}	with heatsink compound		0.25		K/W
Weight			6		g

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TO-247 AD 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
ØP	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	-
ØP1	-	0.291	-	7.39

Fig. 1 Power dissipation

Fig. 2 Typ. output characteristics

Fig. 3 Typ. output characteristics

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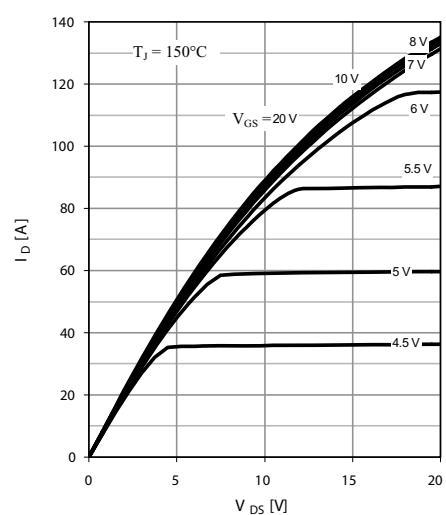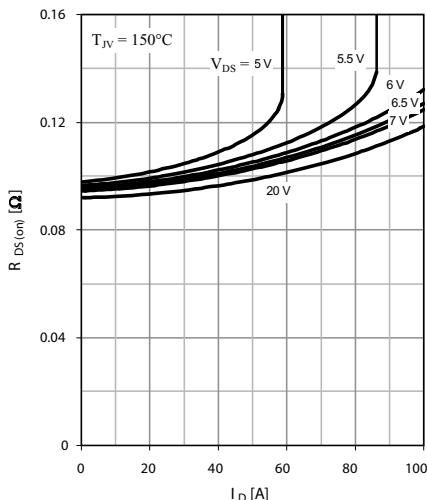
Fig. 4 Typ. drain-source on-state resistance characteristics of IGBT
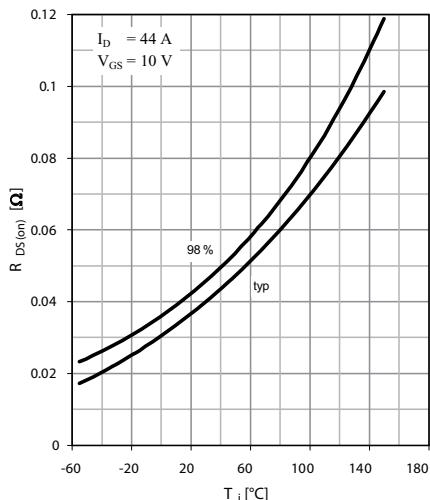
Fig. 5 Drain-source on-state resistance
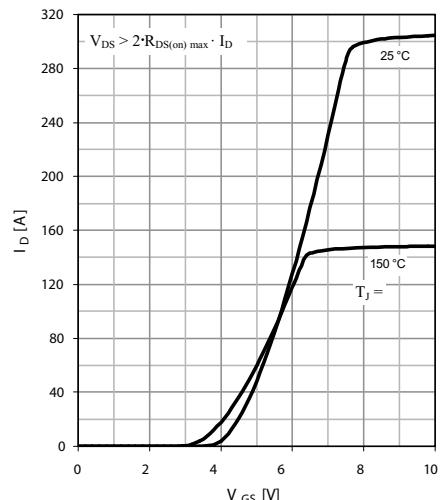

Fig. 6 Typ. transfer characteristics
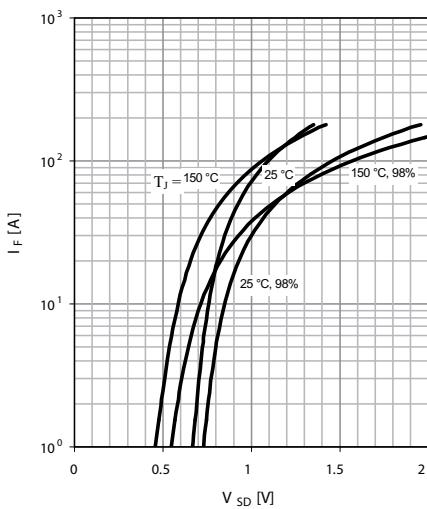

Fig. 7 Forward characteristic of reverse diode
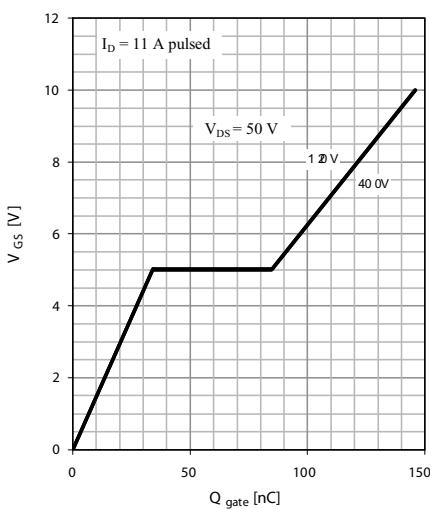

Fig. 8 Typ. gate charge
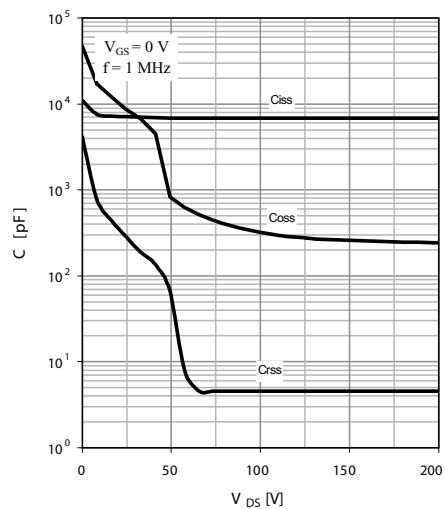

Fig. 9 Typ. capacitances
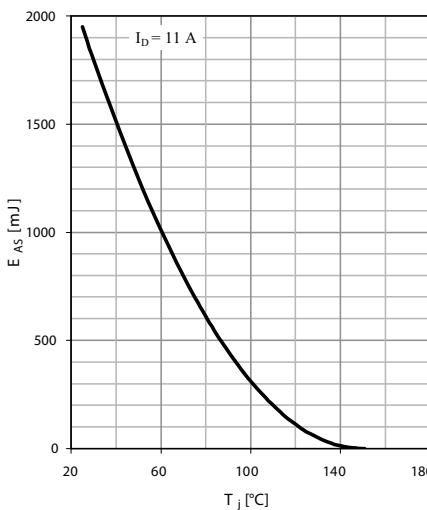
Fig. 10 Avalanche energy
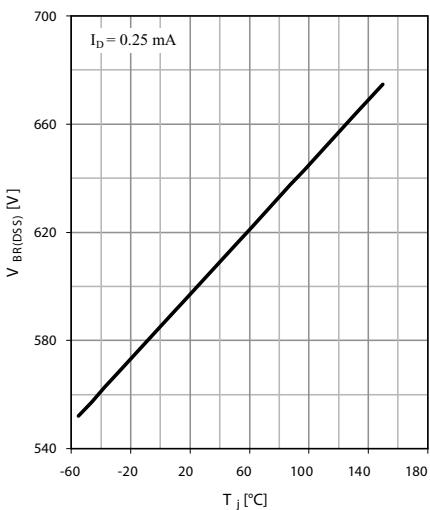
Fig. 11 Drain-source breakdown voltage
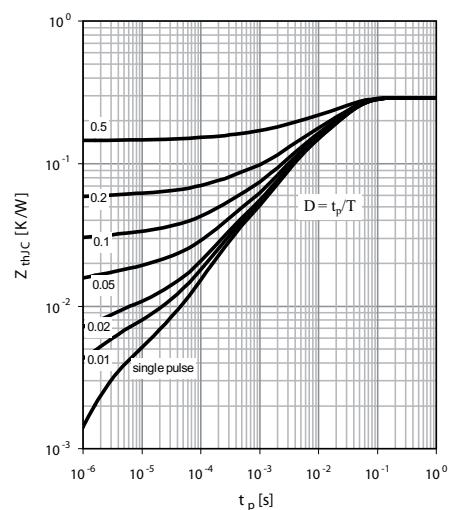
Fig. 12 Max. transient thermal impedance

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