IXYS

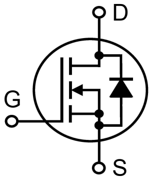
X2-Class Power MOSFET

IXTQ34N65X2M

V_{DSS} = 650V
I_{D25} = 34A
$R_{DS(on)} \leq$ 96mΩ

(Electrically Isolated Tab)

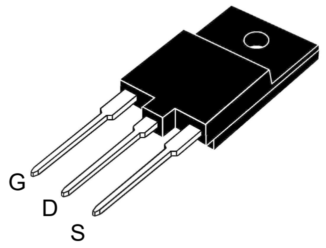
N-Channel Enhancement Mode
Avalanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	650	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1 MΩ	650	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	T_C = 25°C, Limited by T_{JM}	34	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	48	A
I_A	T_C = 25°C	17	A
E_{AS}	T_C = 25°C	1	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, T_J =150°C	15	V/ns
P_D	T_C = 25°C	43	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10s	300	°C
V_{ISOL}	50/60 Hz, 1 Minute	2500	V~
M_d	Mounting Torque	1.13/10	Nm/lb.in
Weight		5	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	650			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	3.0		5.0	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V T_J = 125°C			10 150	µA µA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Note 1			96	mΩ

OVERMOLDED
(IXTQ...M) OUTLINE



G = Gate D = Drain
S = Source

Features

- Plastic Overmolded Tab for Electrical Isolation
- Avalanche Rated
- 2500V~ Electrical Isolation
- Low Package Inductance

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	20	30		S
R_{Gi}	Gate Input Resistance		0.90		Ω
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3000		pF
C_{oss}			2180		pF
C_{rss}			1.7		pF
	Effective Output Capacitance				
$C_{o(er)}$	Energy related } V_{GS} = 0V		125		pF
$C_{o(tr)}$	Time related } V_{DS} = 0.8 • V_{DSS}		490		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25} R_G = 10Ω (External)		30		ns
t_r			48		ns
$t_{d(off)}$			68		ns
t_f			30		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		54		nC
Q_{gs}			15		nC
Q_{gd}			20		nC
R_{thJC}				2.9	°C/W
R_{thCS}			0.25		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max	
I_S	V_{GS} = 0V			34	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			136	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.4	V
t_{rr}	I_F = 17A, -di/dt = 100A/μs V_R = 100V		390		ns
Q_{RM}			4.2		μC
I_{RM}			21.8		A

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2 %.

Fig. 1. Output Characteristics @ $T_J = 25^oC$

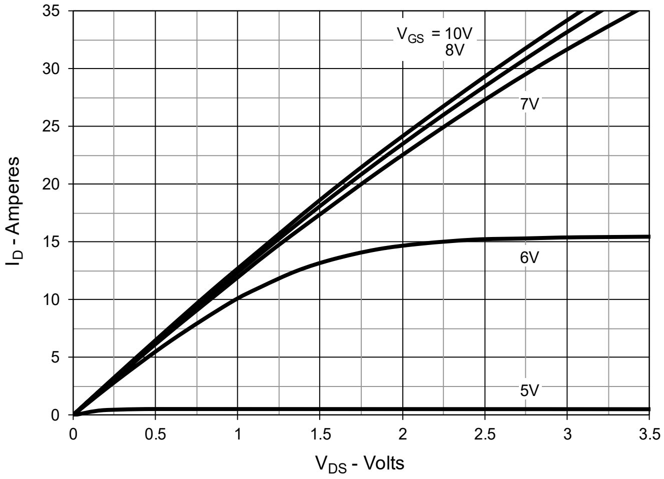


Fig. 2. Extended Output Characteristics @ $T_J = 25^oC$

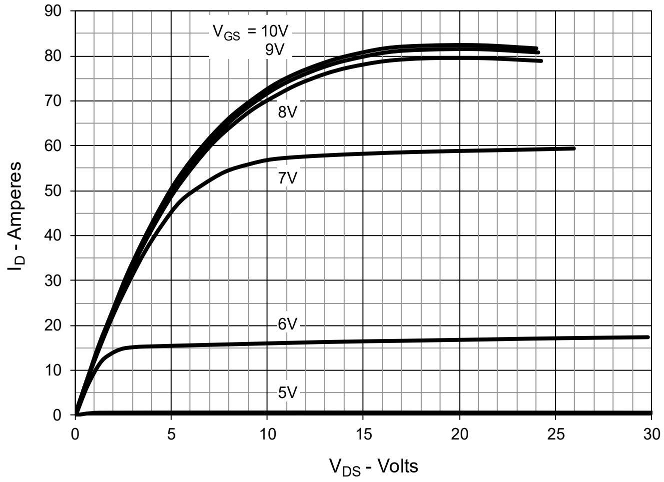


Fig. 3. Output Characteristics @ $T_J = 125^oC$

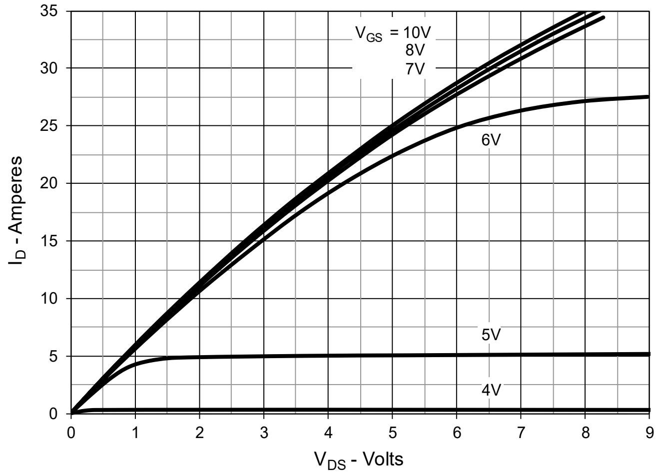


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 17A Value vs. Junction Temperature

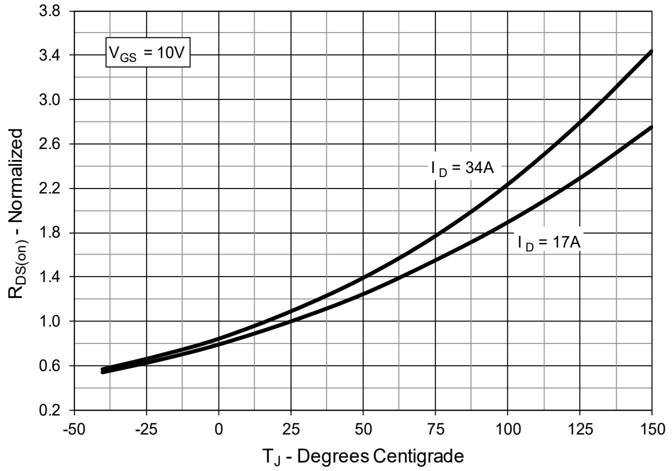


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 17A Value vs. Drain Current

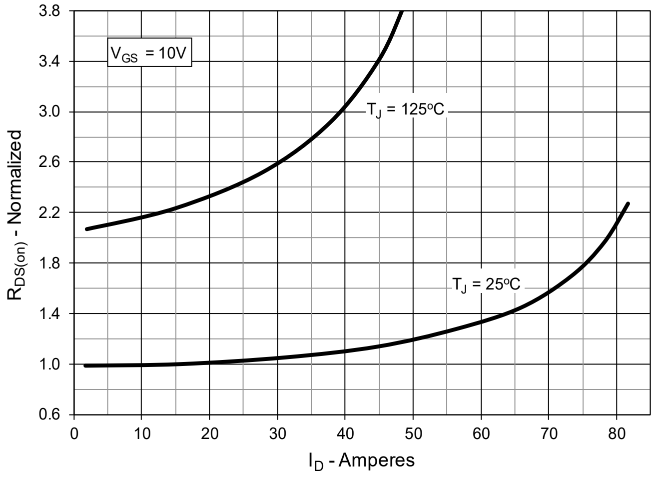


Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature

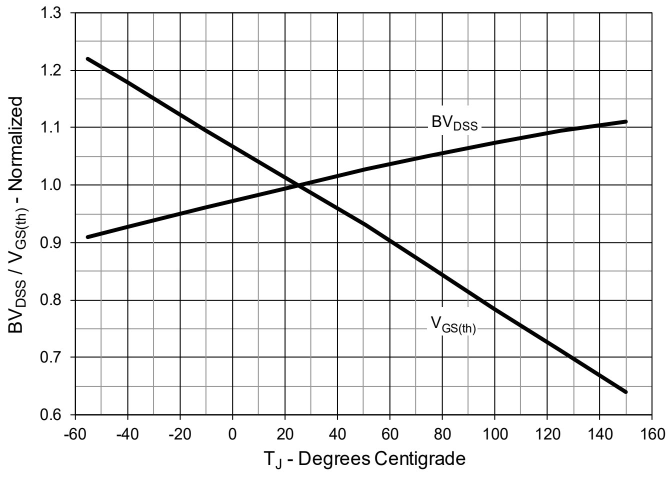


Fig. 7. Input Admittance

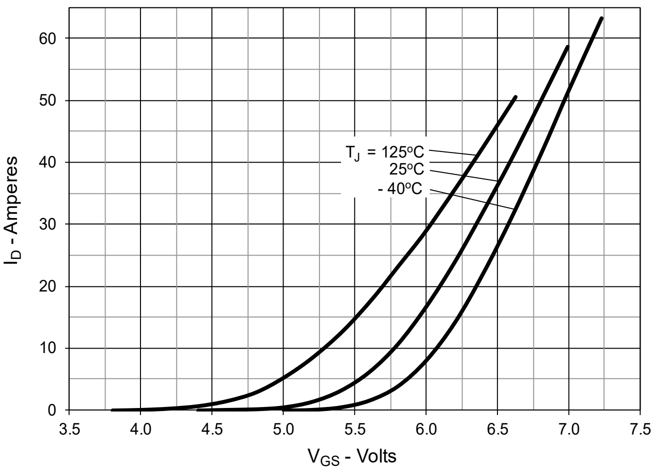


Fig. 8. Transconductance

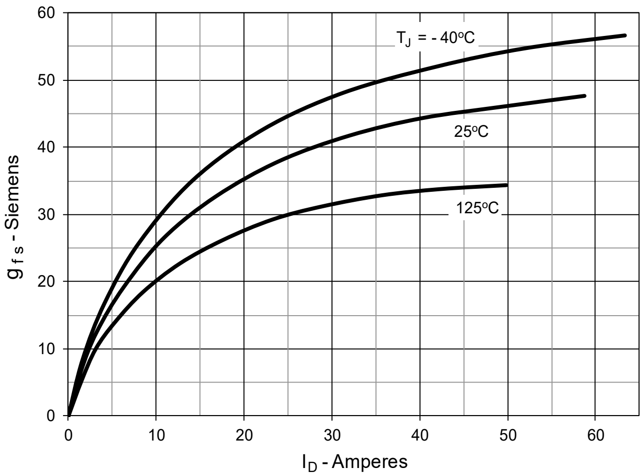


Fig. 9. Forward Voltage Drop of Intrinsic Diode

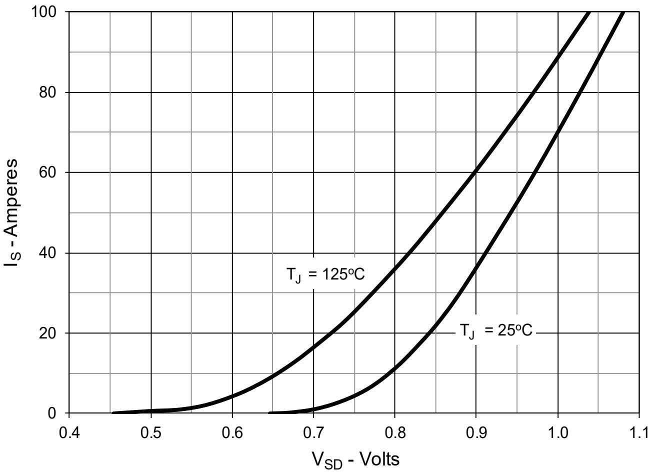


Fig. 10. Gate Charge

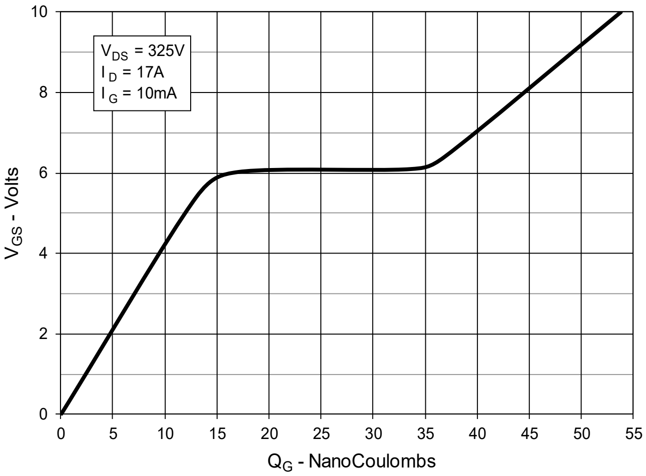


Fig. 11. Capacitance

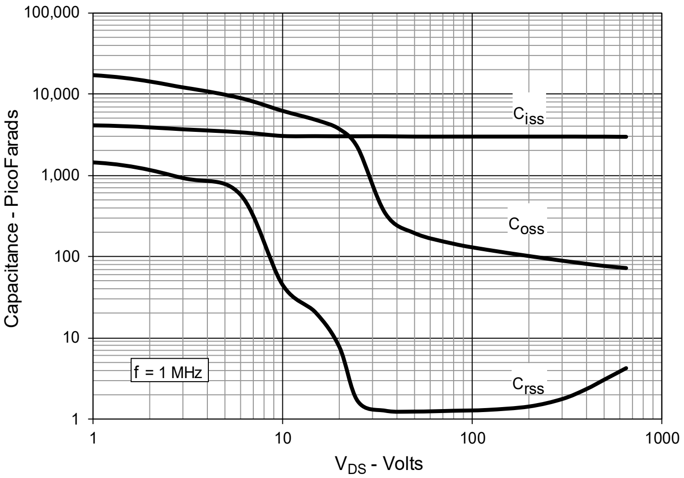


Fig. 12. Output Capacitance Stored Energy

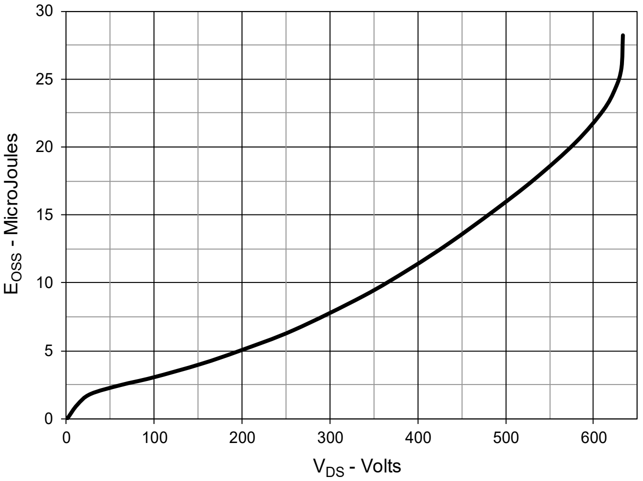


Fig. 13. Forward-Bias Safe Operating Area

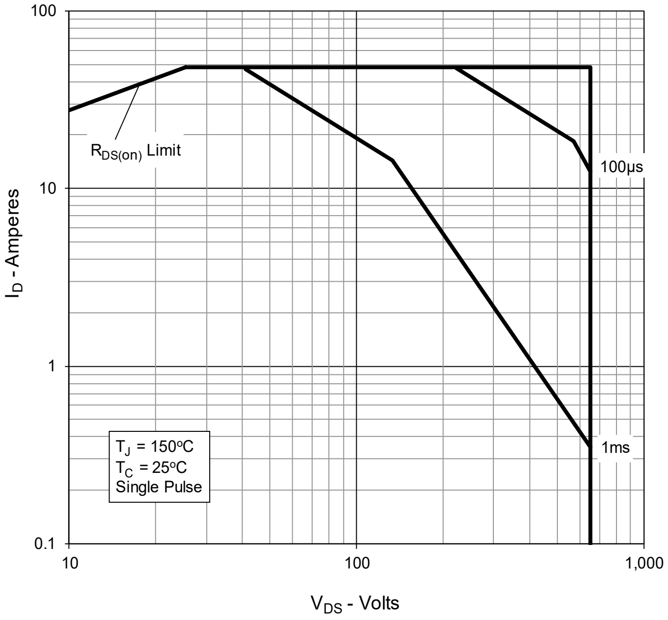
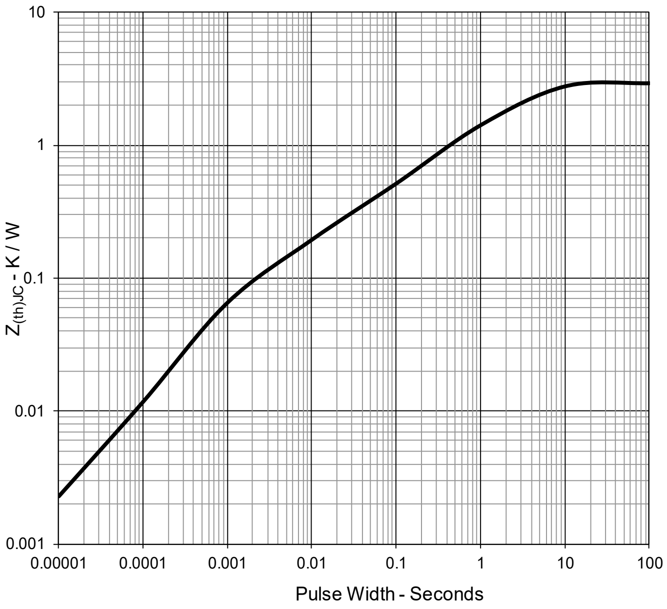


Fig. 14. Maximum Transient Thermal Impedance



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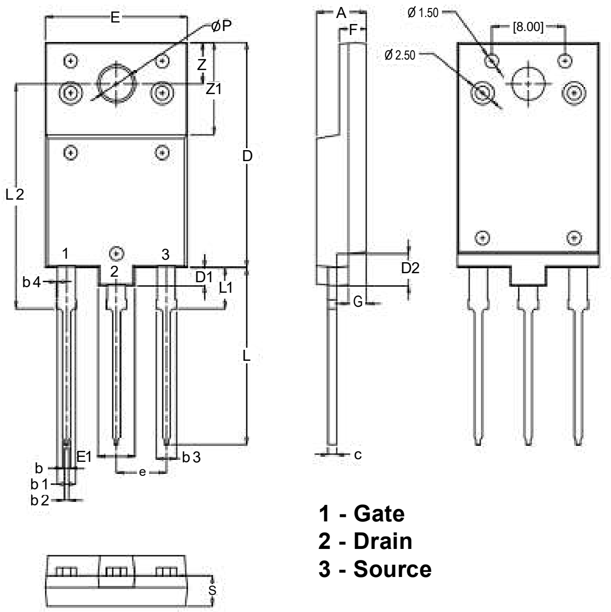
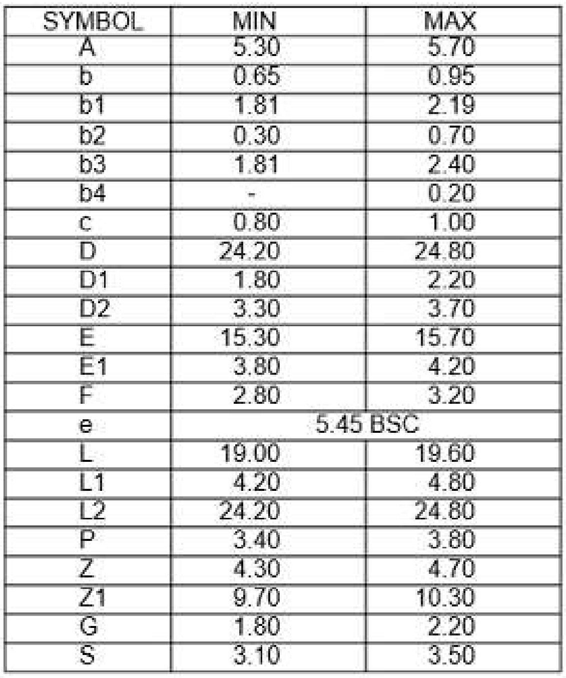
TO-3PFP Outline



1 - Gate
2 - Drain
3 - Source



SYMBOL	MIN	MAX
A	5.30	5.70
b	0.65	0.95
b1	1.81	2.19
b2	0.30	0.70
b3	1.81	2.40
b4	-	0.20
c	0.80	1.00
D	24.20	24.80
D1	1.80	2.20
D2	3.30	3.70
E	15.30	15.70
E1	3.80	4.20
F	2.80	3.20
e	5.45 BSC	
L	19.00	19.60
L1	4.20	4.80
L2	24.20	24.80
P	3.40	3.80
Z	4.30	4.70
Z1	9.70	10.30
G	1.80	2.20
S	3.10	3.50