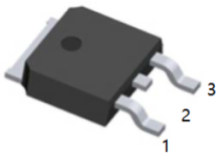
60V N-Channel MOSFET

General Description

This N-Channel MOSFET is produced using process that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

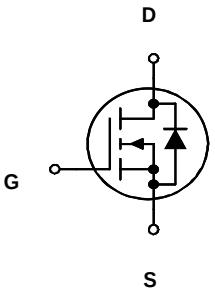


1.G 2.D 3.S

TO-252(DPAK) top view

Application

- Inverter
- Synchronous rectifier
- Primary switch



Features

- V_{DSS} = 60V
- I_D (at V_{GS}=10V)10.7A
- $R_{DS(ON)}$(at V_{GS}=10V) < 12.3mΩ
- $R_{DS(ON)}$(at V_{GS} = 4.5V) < 15.4mΩ
- RoHS Compliant

MOSFET Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter			Ratings	Units
V_{DS}	Drain to Source Voltage			60	V
V_{GS}	Gate to Source Voltage			±20	V
I_D	Drain Current -Continuous	T_C = 25°C		50	A
	-Continuous	T_A = 25°C	(Note 1a)	11.5	
	-Pulsed			100	
E_{AS}	Single Pulse Avalanche Energy		(Note 3)	253	mJ
P_D	Power Dissipation	T_C = 25°C		69	W
	Power Dissipation	T_A = 25°C	(Note 1a)	3.1	
T_J, T_{STG}	Operating and Storage Junction Temperature Range			-55 to +150	°C

Thermal Characteristics

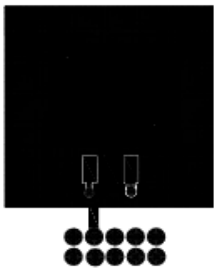
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.8	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	40	

Electrical Characteristics T_J = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	60			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250μA, referenced to 25°C		77		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0V, V_{DS} = 48V,			1	μA
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250μA	1.0	1.6	2.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 250μA, referenced to 25°C		-8		mV/°C
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10V, I_D = 10.7A		10	12	mΩ
		V_{GS} = 4.5V, I_D = 9.5A		12	15	
g_{FS}	Forward Transconductance	V_{DD} = 5V, I_D = 10.7A		41		S
C_{iss}	Input Capacitance	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz		2420	3215	pF
C_{oss}	Output Capacitance			215	285	pF
C_{rss}	Reverse Transfer Capacitance			120	180	pF
R_g	Gate Resistance	f = 1MHz		1.7		Ω
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 30V, I_D = 10.7A, V_{GS} = 10V, R_{GEN} = 6Ω		11	20	ns
t_r	Rise Time			6	11	ns
$t_{d(off)}$	Turn-Off Delay Time			36	58	ns
t_f	Fall Time			4	10	ns
Q_g	Total Gate Charge	V_{GS} = 0V to 10V, V_{DD} = 30V, I_D = 10.7A		46	65	nC
Q_g	Total Gate Charge	V_{GS} = 0V to 4.5V, V_{DD} = 30V, I_D = 10.7A		23	32	nC
Q_{gs}	Gate to Source Charge	V_{DD} = 30V, I_D = 10.7A		7		nC
Q_{gd}	Gate to Drain “Miller” Charge	V_{DD} = 30V, I_D = 10.7A		9		nC
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0V, I_S = 10.7A (Note 2)		0.8	1.3	V
		V_{GS} = 0V, I_S = 2.6A (Note 2)		0.7	1.2	
t_{rr}	Reverse Recovery Time	I_F = 10.7A, di/dt = 100A/μs		28	45	ns
Q_{rr}	Reverse Recovery Charge			21	34	nC

Notes:

1: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.



a) 40°C/W when mounted on a 1 in^2 pad of 2 oz copper

b) 96°C/W when mounted on a minimum pad.

2: Pulse Test: Pulse Width < 300μs, Duty cycle < 2.0%.

3: E_{AS} of 253mJ is based on starting T_J = 25°C, L = 3mH, I_{AS} = 13A, V_{DD} = 60V, V_{GS} = 10V. 100% test at L = 0.1mH, I_{AS} = 41A.

Typical Characteristics T_J = 25°C unless otherwise noted

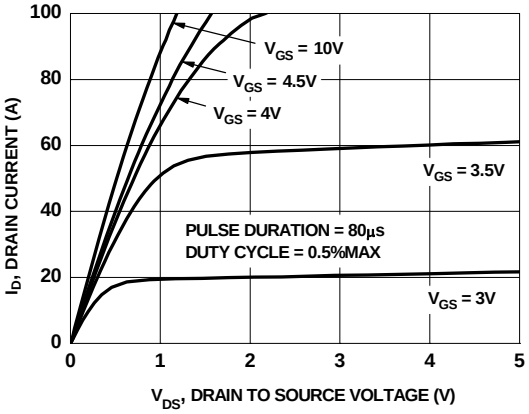


Figure 1. On-Region Characteristics

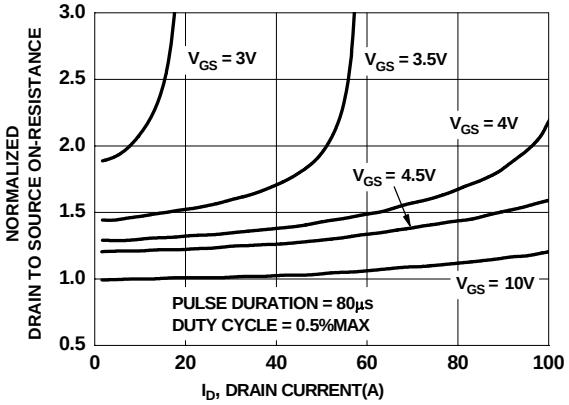


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

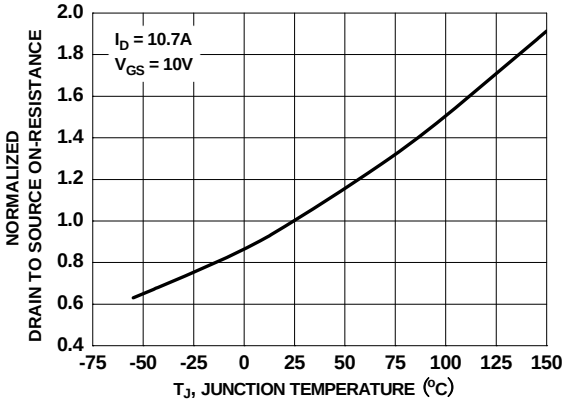


Figure 3. Normalized On-Resistance vs Junction Temperature

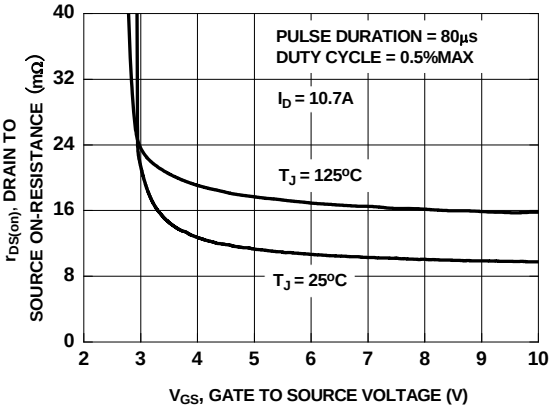


Figure 4. On-Resistance vs Gate to Source Voltage

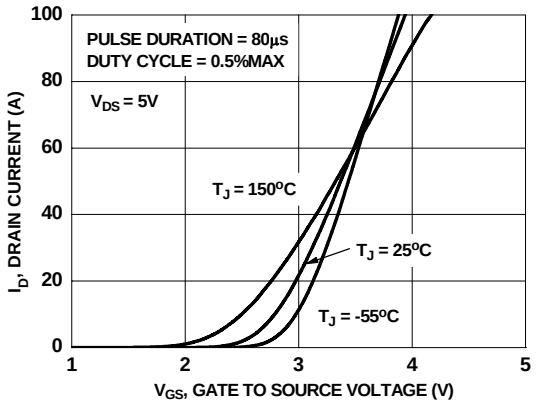


Figure 5. Transfer Characteristics

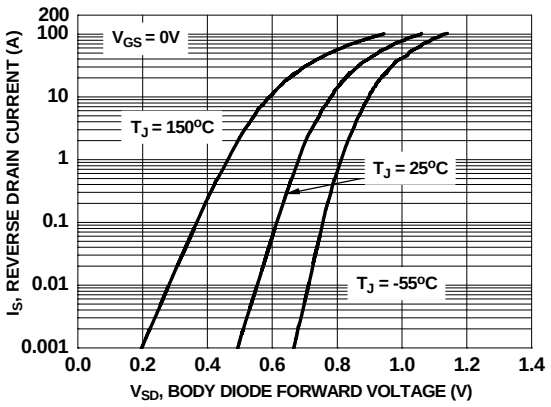


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics T_J = 25°C unless otherwise noted

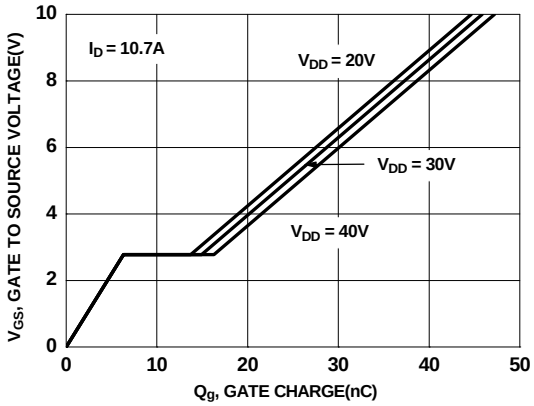


Figure 7. Gate Charge Characteristics

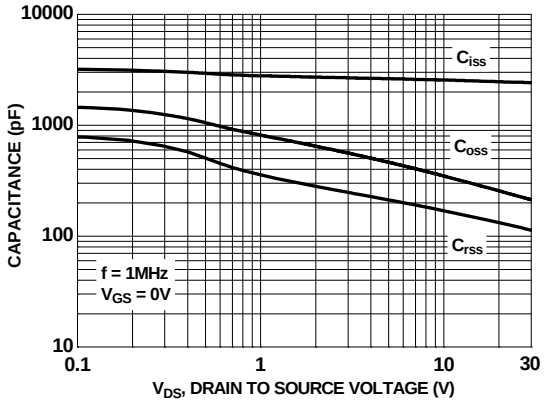


Figure 8. Capacitance vs Drain to Source Voltage

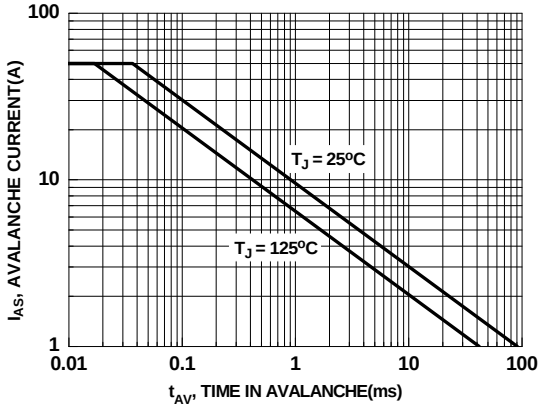


Figure 9. Unclamped Inductive Switching Capability

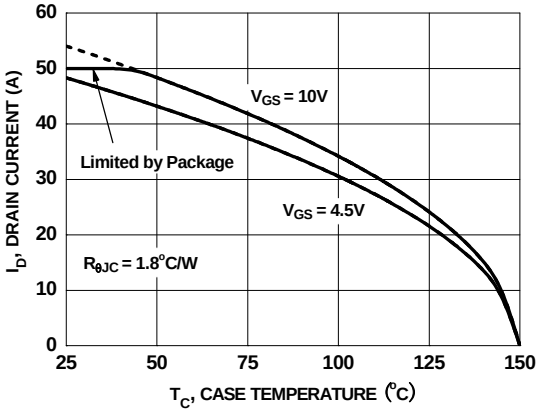


Figure 10. Maximum Continuous Drain Current vs Case Temperature

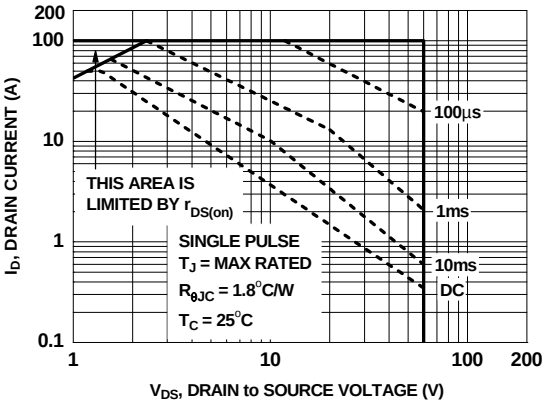


Figure 11. Forward Bias Safe Operating Area

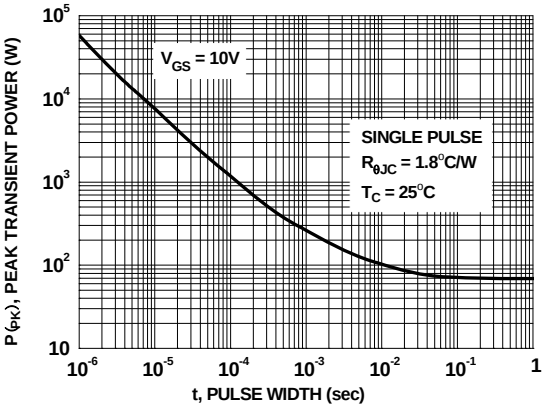


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics T_J = 25°C unless otherwise noted

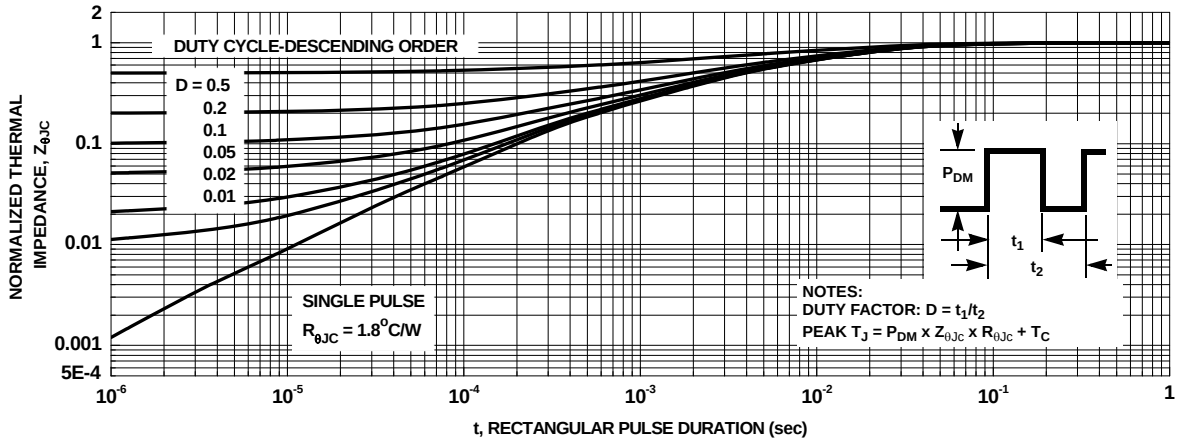


Figure 13. Transient Thermal Response Curve

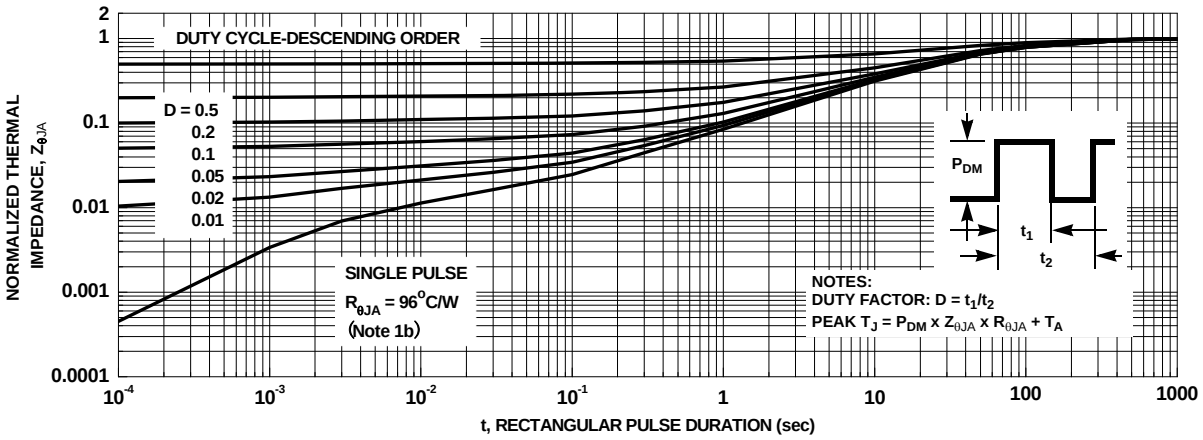
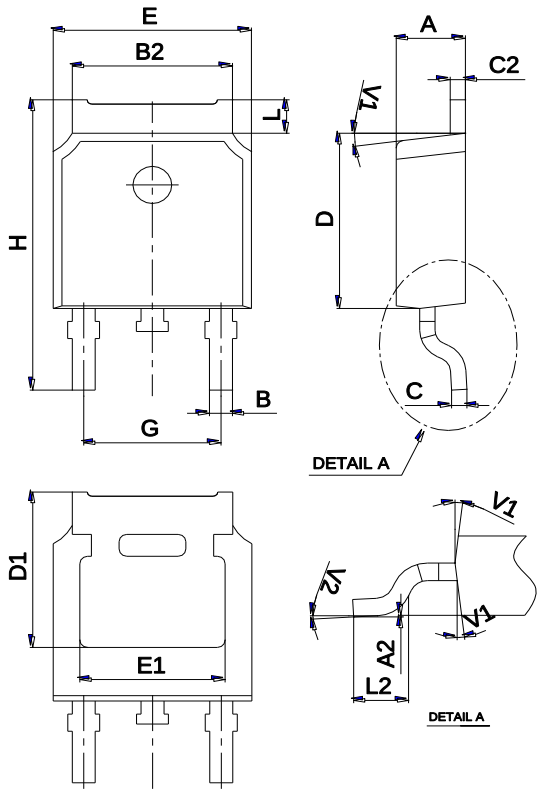


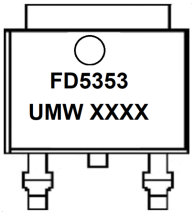
Figure 14. Transient Thermal Response Curve

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW FDD5353	TO-252	2500	Tape and reel

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by Youtai ***manufacturer:***

Other Similar products are found below :

IRFD120 JANTX2N5237 2SK2267(Q) BUK455-60A/B TK100A10N1,S4X(S MIC4420CM-TR VN1206L NDP4060 SI4482DY IRS2092STRPBF-EL IPS70R2K0CEAKMA1 TK31J60W5,S1VQ(O TK31J60W,S1VQ(O TK16J60W,S1VQ(O 2SK2614(TE16L1,Q) DMN1017UCP3-7 EFC2J004NUZTDG P85W28HP2F-7071 DMN1053UCP4-7 NTE2384 DMC2700UDMQ-7 DMN2080UCB4-7 DMN61D9UWQ-13 US6M2GTR DMN31D5UDJ-7 DMP22D4UFO-7B IPS60R3K4CEAKMA1 DMN1006UCA6-7 DMN16M9UCA6-7 STF5N65M6 IRF40H233XTMA1 STU5N65M6 DMN6022SSD-13 DMN13M9UCA6-7 DMTH10H4M6SPS-13 IPS60R360PFD7SAKMA1 DMN2990UFB-7B SSM3K35CT,L3F IPLK60R1K0PFD7ATMA1 2N7002W-G MCAC30N06Y-TP IPWS65R035CFD7AXKSA1 MCQ7328-TP SSM3J143TU,LXHF DMN12M3UCA6-7 PJMF280N65E1_T0_00201 PJMF380N65E1_T0_00201 PJMF280N60E1_T0_00201 PJMF600N65E1_T0_00201 PJMF900N65E1_T0_00201