EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

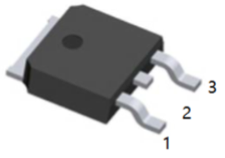
Product Specification

Domestic	Part Number	FDD4243
Overseas	Part Number	FDD4243
Equivalent	Part Number	FDD4243

P-Channel MOSFET

Features

- V_{DS} (V) =-40V
- $R_{DS(ON)}$ < 44mΩ (V_{GS} =-10V)
- $R_{DS(ON)}$ < 64mΩ (V_{GS} =-4.5V)
- High performance trench technology for extremely low $r_{DS(on)}$
- RoHS Compliant



1.G 2.D 3.S

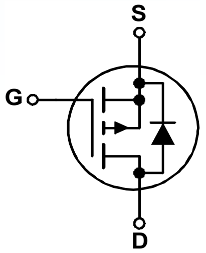
TO-252(DPAK) top view

General Description

This P-Channel MOSFET has been produced technology to deliver low $r_{DS(on)}$ and optimized Bvdss capability to offer superior performance benefit in the applications.

Application

- Inverter
- Power Supplies



MOSFET Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DS}	Drain to Source Voltage	-40	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current -Continuous (Package limited) T_C= 25°C	-14	A
	-Continuous (Silicon limited) T_C= 25°C (Note 1)	-24	
	-Continuous T_A= 25°C (Note 1a)	-6.7	
	-Pulsed	-60	
E_{AS}	Single Pulse Avalanche Energy (Note 3)	84	mJ
P_D	Power Dissipation T_C= 25°C	42	W
	Power Dissipation (Note 1a)	3	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.0	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	40	

P-Channel MOSFET

Electrical Characteristics $T_J = 25°C$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units

Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = -250\mu A$, $V_{GS} = 0V$	-40			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = -250\mu A$, referenced to 25°C		-32		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -32V$, $V_{GS} = 0V$			-1	µA
		$T_J = 125°C$			-100	
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			±100	nA

On Characteristics

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = -250\mu A$	-1.4	-1.6	-3.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = -250\mu A$, referenced to 25°C		4.7		mV/°C
$r_{DS(on)}$	Drain to Source On Resistance	$V_{GS} = -10V$, $I_D = -6.7A$		36	44	mΩ
		$V_{GS} = -4.5V$, $I_D = -5.5A$		48	64	
g_{FS}	Forward Transconductance	$V_{DS} = -5V$, $I_D = -6.7A$		16		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = -20V$, $V_{GS} = 0V$, f = 1MHz		1165	1550	pF
C_{oss}	Output Capacitance			165	220	pF
C_{rss}	Reverse Transfer Capacitance			90	135	pF
R_g	Gate Resistance	f = 1MHz		4		Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = -20V$, $I_D = -6.7A$ $V_{GS} = -10V$, $R_{GEN} = 6\Omega$		6	12	ns
t_r	Rise Time			15	26	ns
$t_{d(off)}$	Turn-Off Delay Time			22	35	ns
t_f	Fall Time			7	14	ns
$Q_{g(TOT)}$	Total Gate Charge at 10V	$V_{DD} = -20V$, $I_D = -6.7A$ $V_{GS} = -10V$		21	29	nC
Q_{gs}	Gate to Source Gate Charge			3.4		nC
Q_{gd}	Gate to Drain “Miller” Charge			4		nC

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Forward Voltage	$V_{GS} = 0V$, $I_S = -6.7A$ (Note 2)		0.86	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = -6.7A$, di/dt = 100A/µs		29	43	ns
Q_{rr}	Reverse Recovery Charge			30	44	nC

Notes:

1: $R_{\theta JA}$ is sum of 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 $R_{\theta JC}$ 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: Starting T_J = 25°C, L = 3mH, I_{AS} = 7.5A, V_{DD} = 40V, V_{GS} = 10V.

P-Channel MOSFET

Typical Characteristics T_J = 25°C unless otherwise noted

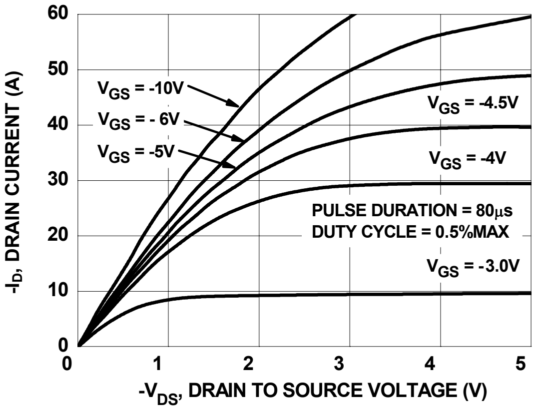


Figure 1. On Region Characteristics

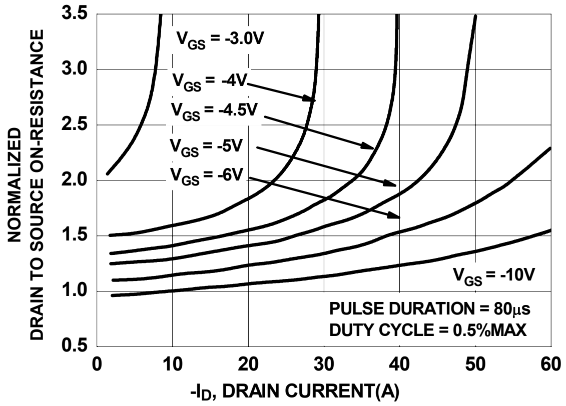


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

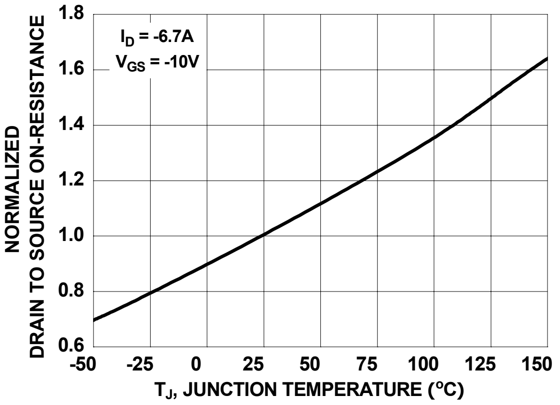


Figure 3. Normalized On Resistance vs Junction Temperature

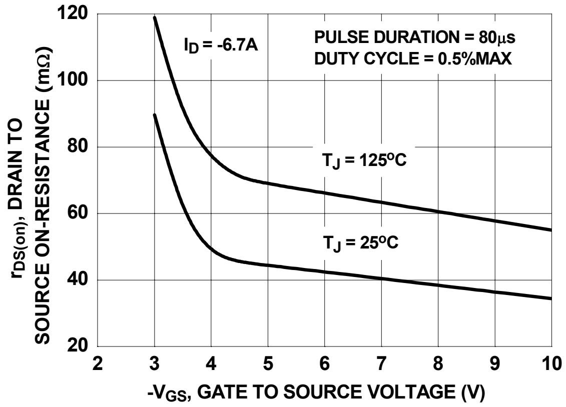


Figure 4. On-Resistance vs Gate to Source Voltage

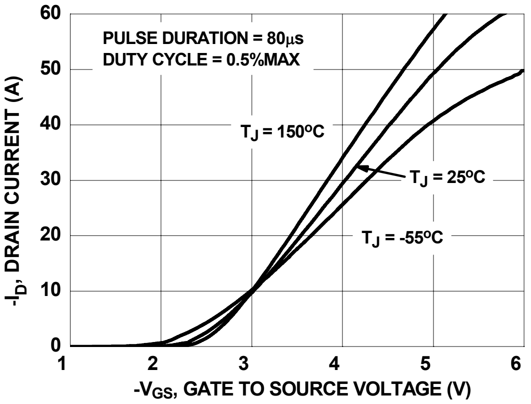


Figure 5. Transfer Characteristics

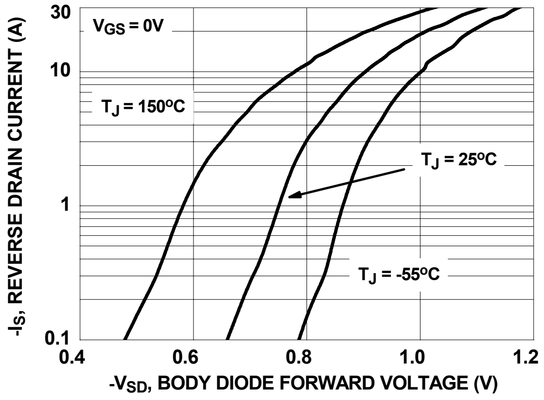


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics T_J = 25°C unless otherwise noted

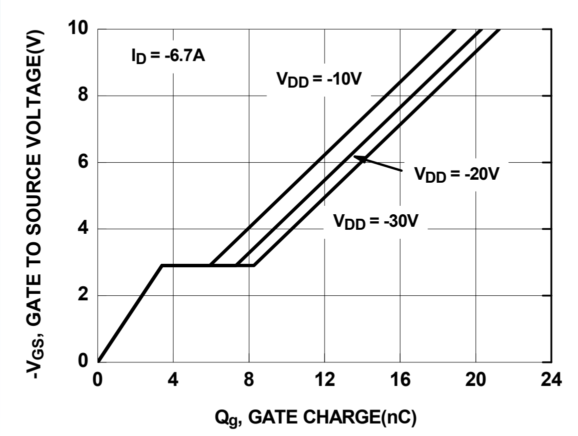


Figure 7. Gate Charge Characteristics

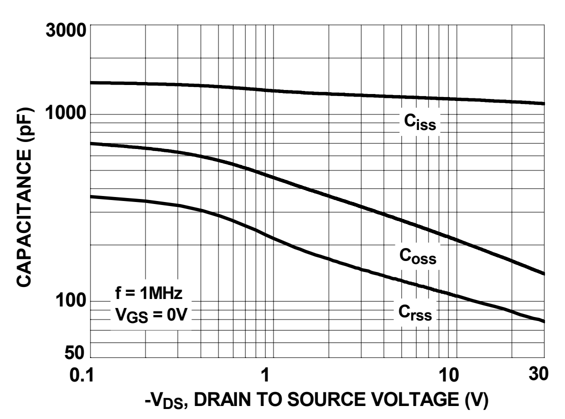


Figure 8. Capacitance vs Drain to Source Voltage

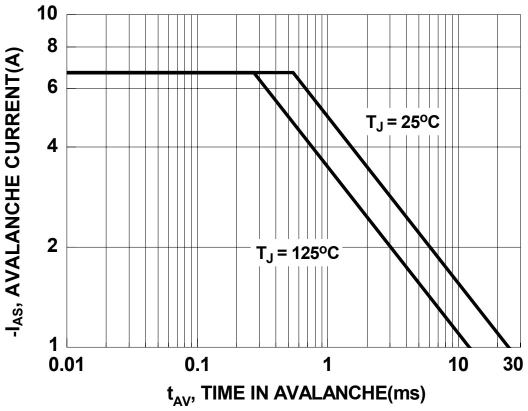


Figure 9. Unclamped Inductive Switching Capability

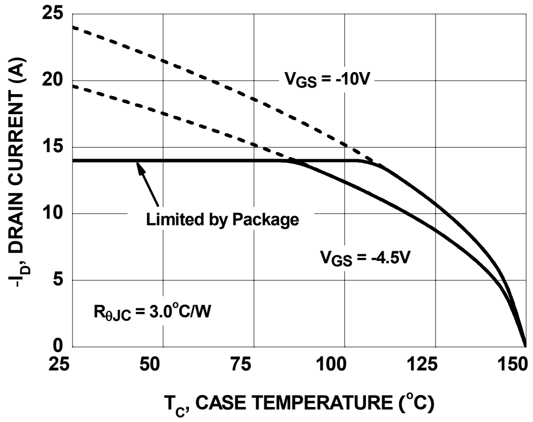


Figure 10. Maximum Continuous Drain Current vs Case Temperature

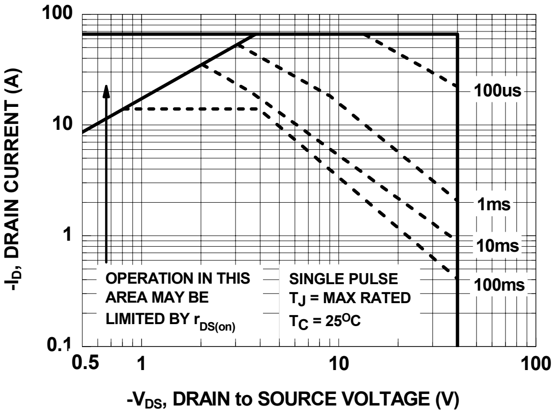


Figure 11. Forward Bias Safe Operating Area

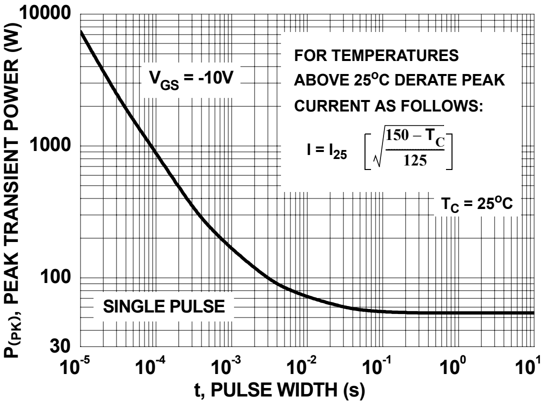


Figure 12. Single Pulse Maximum Power Dissipation

P-Channel MOSFET

Typical Characteristics T_J = 25°C unless otherwise noted

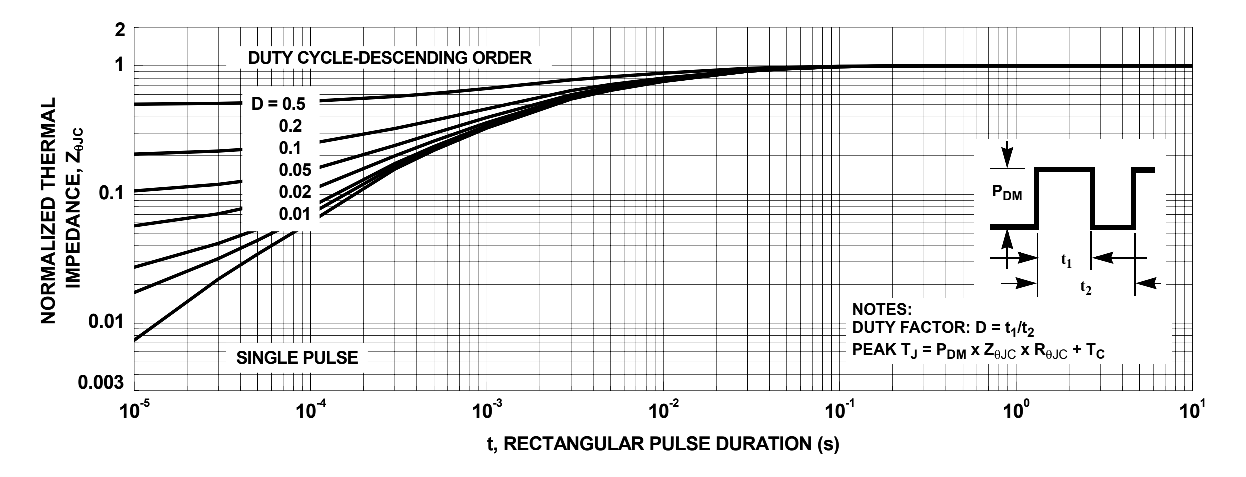
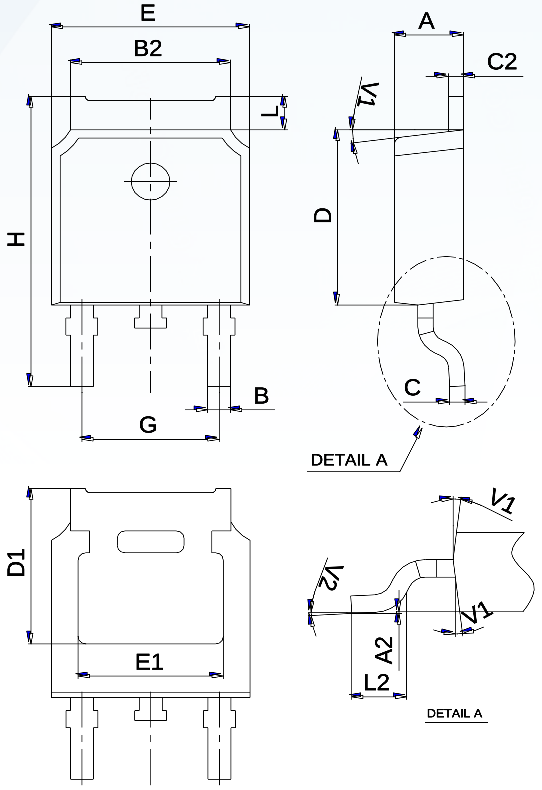


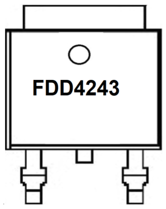
Figure 13. Transient Thermal Response Curve

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
FDD4243	TO-252	2500	Tape and reel

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