

FDS7064A

30V N-Channel PowerTrench[®] MOSFET

General Description

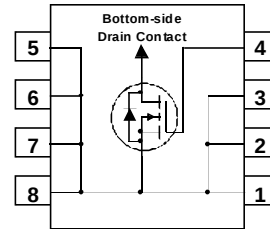
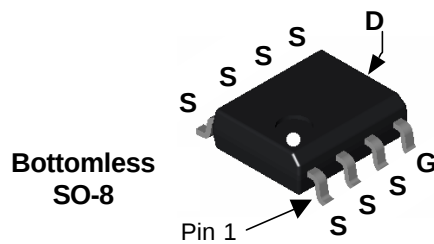
This N-Channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for "low side" synchronous rectifier operation, providing an extremely low $R_{DS(ON)}$ in a small package.

Applications

- Synchronous rectifier
- DC/DC converter

Features

- 19 A, 30 V $R_{DS(ON)} = 6.5 \text{ m}\Omega @ V_{GS} = 4.5 \text{ V}$
- High performance trench technology for extremely low $R_{DS(ON)}$
- High power and current handling capability
- Fast switching
- Bottomless[™] SO-8 package: Enhanced thermal performance in industry-standard package size



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous (Note 1a)	19	A
	– Pulsed	60	
P_D	Power Dissipation for Single Operation (Note 1a)	3.9	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to $+175$	$^\circ\text{C}$

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	38	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
FDS7064A	FDS7064A	13"	12mm	2500 units

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain–Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C		20		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			1	μA
I_{GSSF}	Gate–Body Leakage, Forward	$V_{GS} = 12\text{ V}, V_{DS} = 0\text{ V}$			100	nA
I_{GSSR}	Gate–Body Leakage, Reverse	$V_{GS} = -12\text{ V}, V_{DS} = 0\text{ V}$			-100	nA

On Characteristics (Note 2)

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.8	1.2	2	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C		-4		mV/ $^\circ\text{C}$
$R_{DS(on)}$	Static Drain–Source On–Resistance	$V_{GS} = 4.5\text{ V}, I_D = 19\text{ A}$ $V_{GS} = 10\text{ V}, I_D = 21\text{ A}$			6.5 5.5	m Ω
$I_{D(on)}$	On–State Drain Current	$V_{GS} = 4.5\text{ V}, V_{DS} = 5\text{ V}$	50			A
g_{FS}	Forward Transconductance	$V_{DS} = 10\text{ V}, I_D = 19\text{ A}$		75		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		5070		pF
C_{oss}	Output Capacitance			550		pF
C_{rss}	Reverse Transfer Capacitance			230		pF

Switching Characteristics (Note 2)

$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = 10\text{ V}, I_D = 1\text{ A},$ $V_{GS} = 4.5\text{ V}, R_{GEN} = 6\text{ }\Omega$		17	25	ns
t_r	Turn–On Rise Time			18	25	ns
$t_{d(off)}$	Turn–Off Delay Time			69	100	ns
t_f	Turn–Off Fall Time			29	42	ns
Q_g	Total Gate Charge	$V_{DS} = 15\text{ V}, I_D = 19\text{ A},$ $V_{GS} = 4.5\text{ V}$		33	46	nC
Q_{gs}	Gate–Source Charge			7.5		nC
Q_{gd}	Gate–Drain Charge			6.8		nC

Drain–Source Diode Characteristics and Maximum Ratings

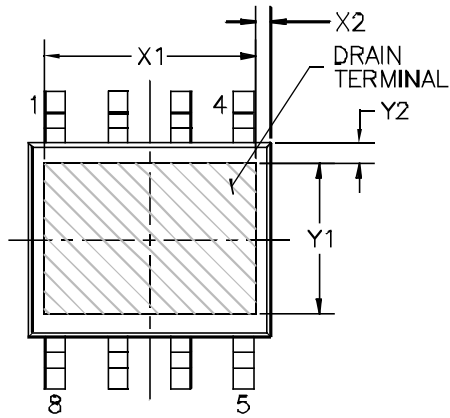
I_S	Maximum Continuous Drain–Source Diode Forward Current				3.2	A
V_{SD}	Drain–Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 3.2\text{ A}$ (Note 2)			1.2	V

Notes:

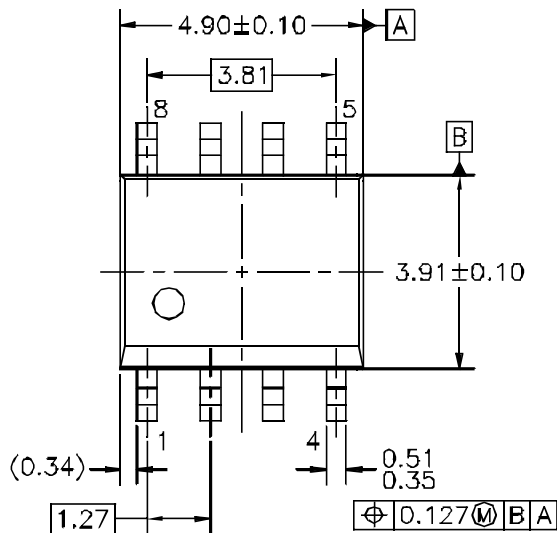
1. $R_{\theta JA}$ is the junction-to-ambient thermal resistance. $R_{\theta JA}$ depends on the user's board design.

a) 38°C/W when mounted on a 1 in^2 pad of 2 oz copper

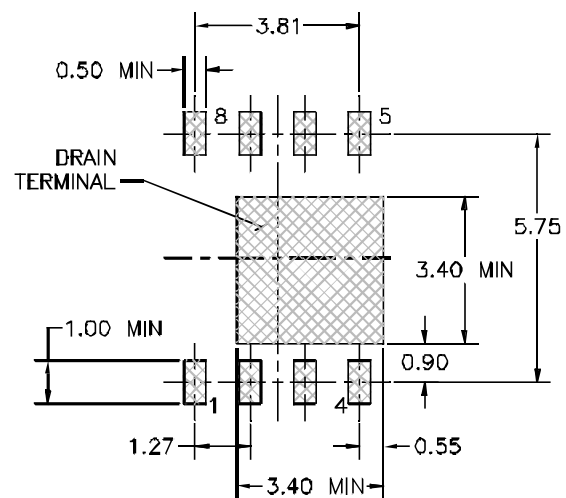
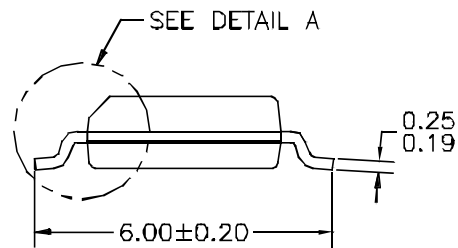
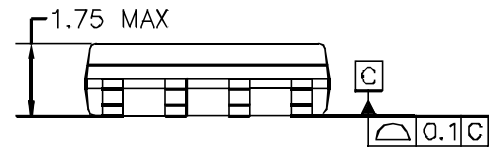
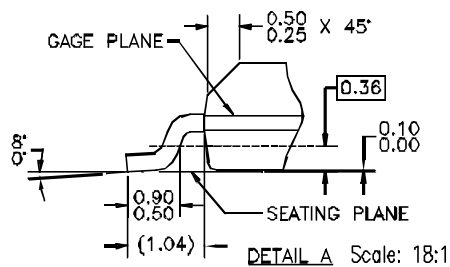
Dimensional Outline and Pad Layout



Bottom View



Top View



Minimum Recommended Landing Pattern

Notes Unless otherwise Specified

- a) All dimensions in mm
- b) Standard lead finish:
20 – 80 μ inches nickel /
6 μ inches palladium
- c) Chip Size Dimensional Table

Chip Size		X2	Y2
X1	Y1		
2.36	2.36	0.75	0.67

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