



FDS2734

N-Channel UltraFET Trench® MOSFET

250V, 3.0A, 117mΩ

Features

- Max $r_{DS(on)}$ = 117mΩ at $V_{GS} = 10V$, $I_D = 3.0A$
- Max $r_{DS(on)}$ = 126mΩ at $V_{GS} = 6V$, $I_D = 2.8A$
- Fast switching speed
- High performance trench technology for extremely low $r_{DS(on)}$
- High power and current handling capability
- RoHS compliant

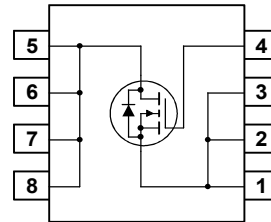
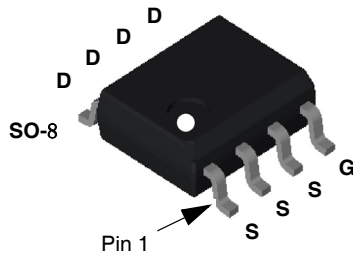


General Descriptions

This single N-Channel MOSFET is produced using Fairchild Semiconductor's advanced UltraFET Trench® process that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Application

- DC-DC conversion



MOSFET Maximum Ratings $T_A = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DS}	Drain to Source Voltage	250	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current -Continuous (Note 1a)	3.0	A
	-Pulsed	50	
E_{AS}	Single Pulse Avalanche Energy (Note 3)	12.5	mJ
P_D	Power dissipation (Note 1a)	2.5	W
	Power dissipation (Note 1b)	1.0	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction- to -Ambient (Note 1a)	50	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction- to- Ambient (Note 1b)	125	
$R_{\theta JC}$	Thermal Resistance, Junction -to- Case (Note 1)	25	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDS2734	FDS2734	SO-8	13"	12mm	2500 units

FDS2734 Single N-Channel UltraFET Trench® MOSFET

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	250			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\mu\text{A}$, referenced to 25°C		157		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 200\text{V}, V_{GS} = 0\text{V}$ $V_{DS} = 200\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$			1 10	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			± 100	nA

On Characteristics (Note 2)

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	2	3	4	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = 250\mu\text{A}$, referenced to 25°C		-10.7		mV/ $^\circ\text{C}$
$r_{DS(on)}$	Drain to Source On Resistance	$V_{GS} = 10\text{V}, I_D = 3.0\text{A}$, $V_{GS} = 6\text{V}, I_D = 2.8\text{A}$, $V_{GS} = 10\text{V}, I_D = 3.0\text{A}, T_J = 125^\circ\text{C}$		97 101 205	117 126 225	m Ω
g_{FS}	Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 3.0\text{A}$		15.1		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$, $f = 1\text{MHz}$		1960	2610	pF
C_{oss}	Output Capacitance			85	130	pF
C_{rss}	Reverse Transfer Capacitance			26	40	pF
R_G	Gate Resistance	$f = 1\text{MHz}$		0.7		Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 125\text{V}, I_D = 3\text{A}$ $V_{GS} = 10\text{V}, R_{GS} = 6\Omega$		23	37	ns
t_r	Rise Time			11	19	ns
$t_{d(off)}$	Turn-Off Delay Time			40	64	ns
t_f	Fall Time			11	19	ns
Q_g	Total Gate Charge		$V_{DS} = 125\text{V}, V_{GS} = 10\text{V}$ $I_D = 3.0\text{A}$		32	45
Q_{gs}	Gate to Source Gate Charge			9		nC
Q_{gd}	Gate to Drain Charge			8		nC

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$I_{SD} = 3.0\text{A}$		0.74	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 3.0\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		72	108	ns
Q_{rr}	Reverse Recovery Charge			185	278	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 $R_{\theta CA}$ is determined by the user's board design.



a) $50^\circ\text{C}/\text{W}$ when mounted on a 1in^2 pad of 2 oz copper



b) $125^\circ\text{C}/\text{W}$ when mounted on a minimum pad of 2 oz copper

Scale 1 : 1 on letter size paper

2: Pulse Test Width $<300\mu\text{s}$, Duty Cycle $<2\%$.
3: Starting $T_J = 25^\circ\text{C}$, $L = 1\text{mH}$, $I_{AS} = 5\text{A}$, $V_{DD} = 100\text{V}$, $V_{GS} = 10\text{V}$

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

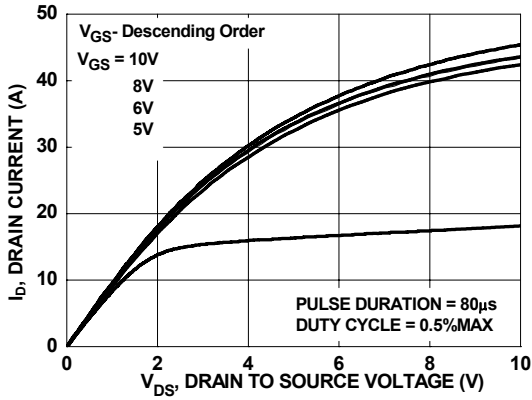


Figure 1. On Region Characteristics

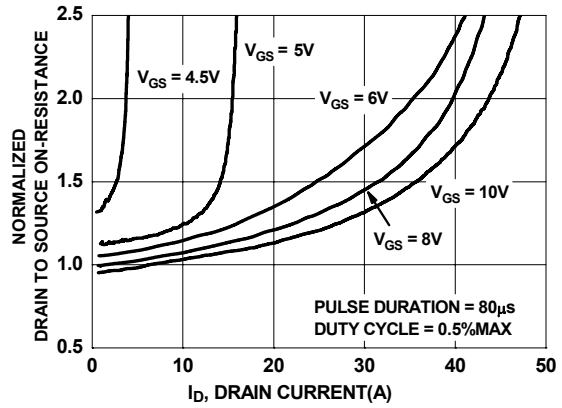


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

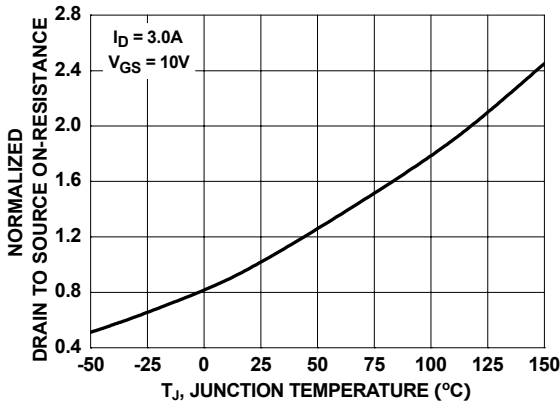


Figure 3. Normalized On Resistance vs Junction Temperature

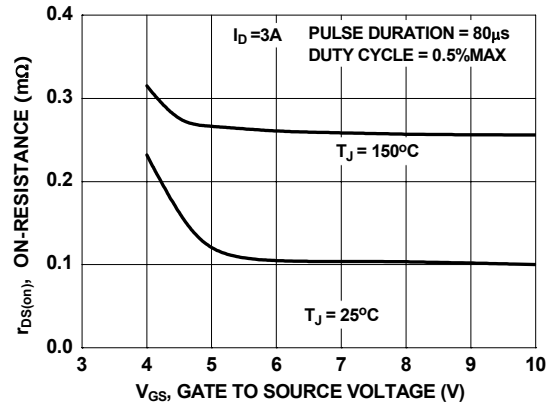


Figure 4. On-Resistance vs Gate to Source Voltage

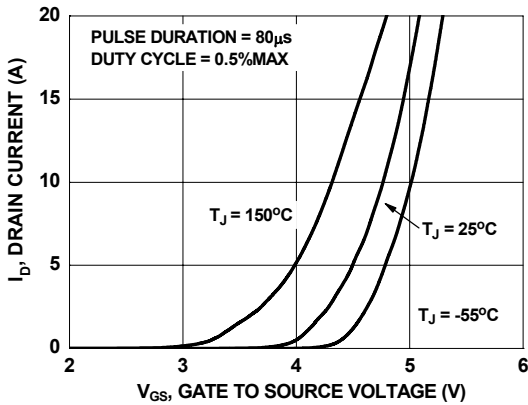


Figure 5. Transfer Characteristics

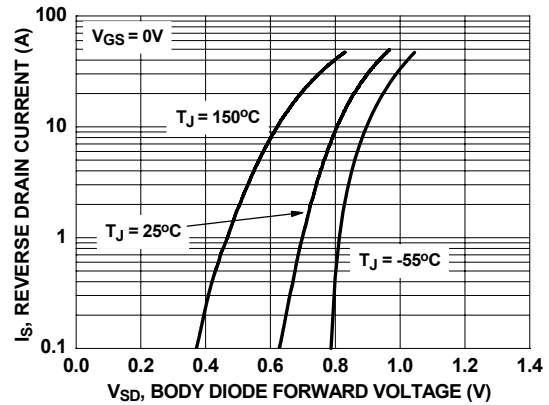


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

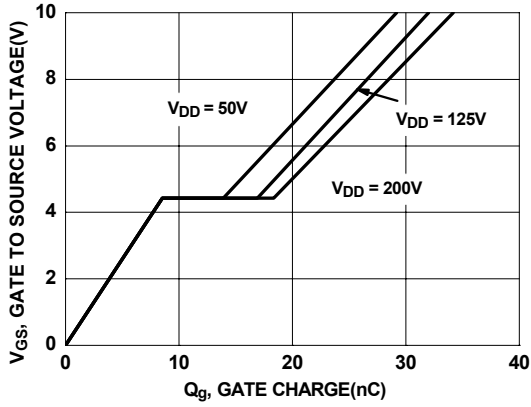


Figure 7. Gate Charge Characteristics

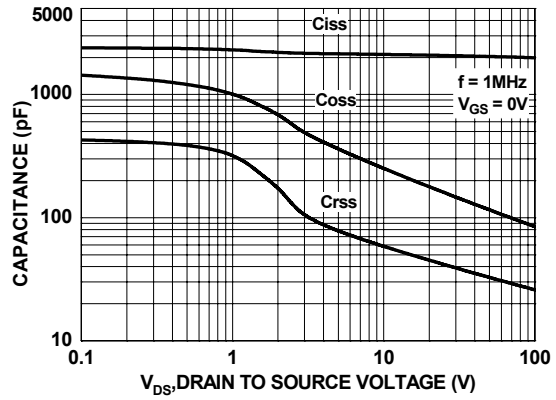


Figure 8. Capacitance vs Drain to Source Voltage

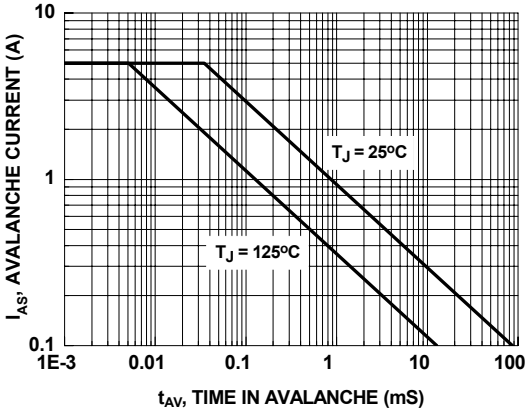


Figure 9. Unclamped Inductive Switching Capability

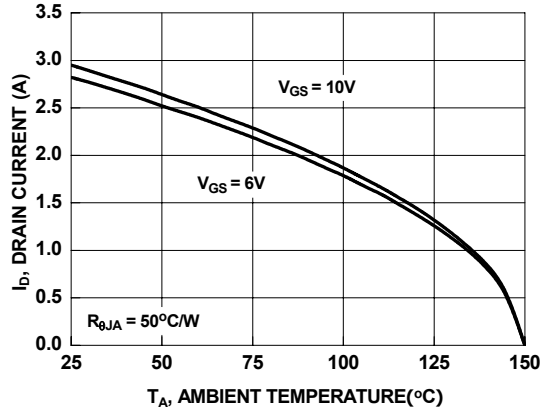


Figure 10. Maximum Continuous Drain Current vs Ambient Temperature

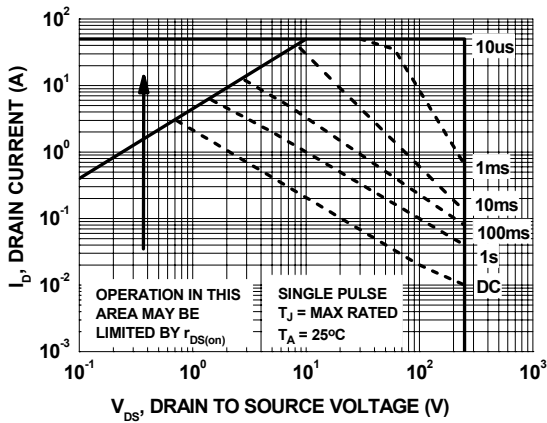


Figure 11. Forward Bias Safe Operating Area

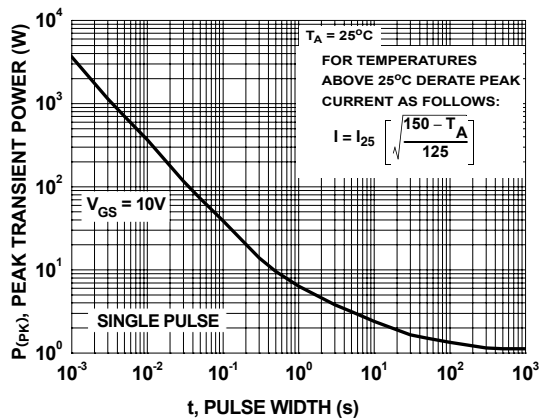


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

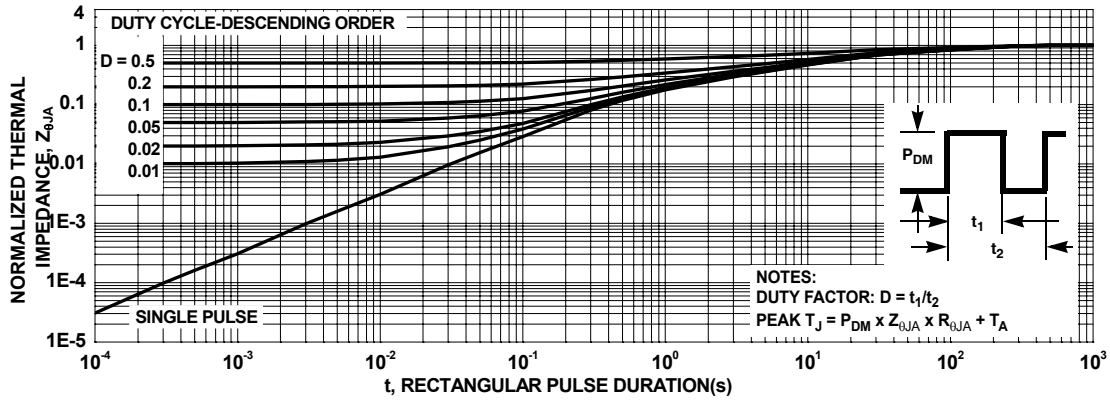


Figure 13. Transient Thermal Response Curve

Thermal characterization performed using the conditions described in Note 1b
 Transient thermal response will change depending on the circuit board design

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACE ^x TM	FACT Quiet Series TM	OCX TM	SILENT SWITCHER [®]	UniFET TM
ActiveArray TM	GlobalOptoisolator TM	OCXPro TM	SMART START TM	UltraFET [®]
Bottomless TM	GTO TM	OPTOLOGIC [®]	SPM TM	VCX TM
Build it Now TM	HiSeC TM	OPTOPLANAR TM	Stealth TM	Wire TM
CoolFET TM	I ² C TM	PACMAN TM	SuperFET TM	
CROSSVOLT TM	<i>i-Lo</i> TM	POP TM	SuperSOT TM -3	
DOMET TM	ImpliedDisconnect TM	Power247 TM	SuperSOT TM -6	
EcoSPARK TM	IntelliMAX TM	PowerEdge TM	SuperSOT TM -8	
E ² CMOS TM	ISOPLANAR TM	PowerSaver TM	SyncFET TM	
EnSigna TM	LittleFET TM	PowerTrench [®]	TCM TM	
FACT TM	MICROCOUPLER TM	QFET [®]	TinyBoost TM	
FAST [®]	MicroFET TM	QS TM	TinyBuck TM	
FAST _r TM	MicroPak TM	QT Optoelectronics TM	TinyPWM TM	
FPS TM	MICROWIRE TM	Quiet Series TM	TinyPower TM	
FRFET TM	MSX TM	RapidConfigure TM	TinyLogic [®]	
	MSXPro TM	RapidConnect TM	TINYOPTO TM	
Across the board. Around the world. TM		μSerDes TM	TruTranslation TM	
The Power Franchise [®]		ScalarPump TM	UHC TM	
Programmable Active Droop TM				

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
- A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.