ON Semiconductor

Is Now

onsemi™

To learn more about onsemi™, please visit our website at
www.onsemi.com

ON Semiconductor®

FDS4935BZ

Dual 30 Volt P-Channel PowerTrench® MOSFET
General Description

This P-Channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers, and battery chargers.

These MOSFETs feature faster switching and lower gate charge than other MOSFETs with comparable $R_{DS(ON)}$ specifications.

The result is a MOSFET that is easy and safer to drive (even at very high frequencies), and DC/DC power supply designs with higher overall efficiency.

Features

- -6.9 A, -30 V. $R_{DS(ON)} = 22$ mΩ @ $V_{GS} = -10$ V
  $R_{DS(ON)} = 35$ mΩ @ $V_{GS} = -4.5$ V

- Extended V_{GSS} range (-25V) for battery applications

- ESD protection diode (note 3)

- High performance trench technology for extremely low $R_{DS(ON)}$

- High power and current handling capability

SO-8

Pin 1
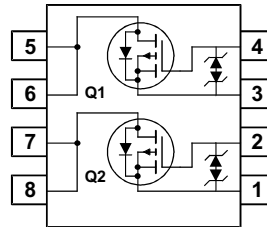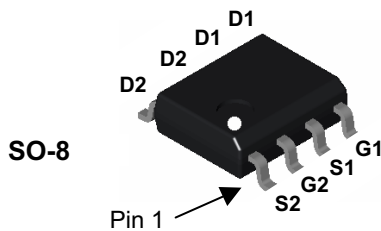
Absolute Maximum Ratings $T_A=25^oC$ unless otherwise noted

Symbol	Parameter		Ratings	Units
$V_{DS\backslash}$	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±25	V
I_D	Drain Current – Continuous	(Note 1a)	-6.9	A
	– Pulsed		-50	
P_D	Power Dissipation for Single Operation	(Note 1a)	1.6	W
		(Note 1b)	1.0	
		(Note 1c)	0.9	
T_J, T_{STG}	Operating and Storage Junction Temperature Range		-55 to $+150$	$^\circ$C

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	(Note 1a)	78	$^\circ$C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	(Note 1)	40	$^\circ$C/W

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
FDS4935BZ	FDS4935BZ	13''	12mm	2500 units

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

| Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain–Source Breakdown Voltage	$V_{GS} = 0$ V, $I_D = -250$ μA	–30			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = -250$ μA, Referenced to 25°C		24		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -24$ V, $V_{GS} = 0$ V			–1	μA
I_{GSS}	Gate–Body Leakage	$V_{GS} = \pm25$ V, $V_{DS} = 0$ V			+10	μA
On Characteristics (Note 2)						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250$ μA	–1	–1.9	–3	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	$I_D = -250$ μA, Referenced to 25°C		–5		mV/°C
$r_{DS(on)}$	Static Drain–Source On–Resistance	$V_{GS} = -10$ V, $I_D = -6.9$ A		18	22	mΩ
		$V_{GS} = -4.5$ V, $I_D = -5.3$ A		27.5	35	
		$V_{GS} = -10$ V, $I_D = -6.9$A,T_J=125°C		26	34	
g_{FS}	Forward Transconductance	$V_{DS} = -5$ V, $I_D = -6.9$ A		22		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -15$ V, $V_{GS} = 0$ V,		1360		pF
C_{oss}	Output Capacitance	f = 1.0 MHz		240		pF
C_{rss}	Reverse Transfer Capacitance			200		pF
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn–On Delay Time	$V_{DD} = -15$ V, $I_D = -1$ A,		12	22	ns
t_r	Turn–On Rise Time	$V_{GS} = -10$ V, $R_{GEN} = 6$ Ω		13	23	ns
$t_{d(off)}$	Turn–Off Delay Time			68	108	ns
t_f	Turn–Off Fall Time			38	61	ns
$Q_{g(TOT)}$	Total Gate Charge, V_{GS} = 10V	$V_{DS} = -15$ V, $I_D = -6.9$ A,		29	40	nC
$Q_{g(TOT)}$	Total Gate Charge, V_{GS} = 5V	$V_{GS} = -10$ V		16	23	nC
Q_{gs}	Gate–Source Charge			4		nC
Q_{gd}	Gate–Drain Charge			7		nC
Drain–Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain–Source Diode Forward Current				–2.1	A
V_{SD}	Drain–Source Diode Forward Voltage	$V_{GS} = 0$ V, $I_S = -2.1$ A (Note 2)		–0.8	–1.2	V
t_{RR}	Reverse Recovery Time	$I_F = -8.8$ A,		24		ns
Q_{RR}	Reverse Recovery Charge	$d_{iF}/d_t = 100$ A/μs (Note 2)		9		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.
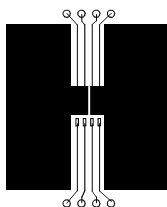
a) 78°C/W steady state when mounted on a 1in^2 pad of 2 oz copper
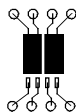
b) 125°C/W when mounted on a .04 in^2 pad of 2 oz copper
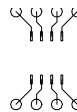
c) 135°C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

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

3. The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied.
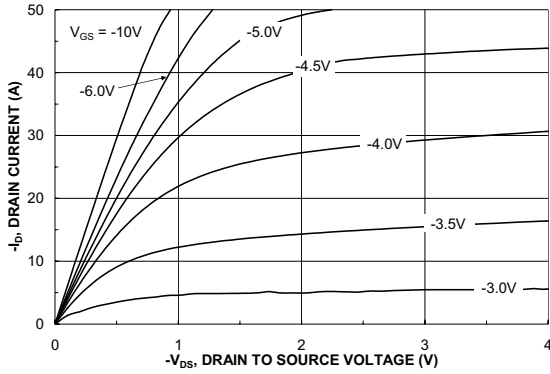
Typical Characteristics
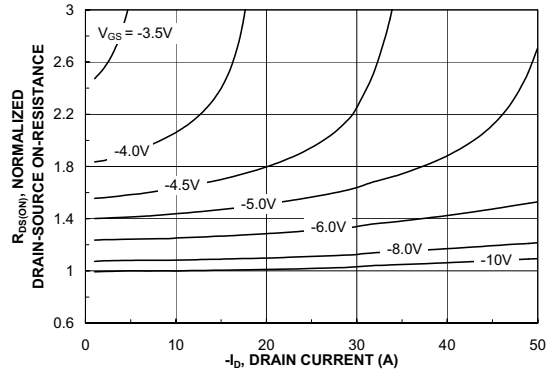

Figure 1. On-Region Characteristics.

Figure 2. On-Resistance Variation with
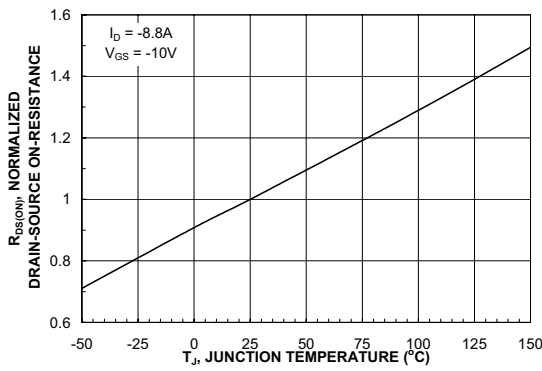Drain Current and Gate Voltage.

Figure 3. On-Resistance Variation with
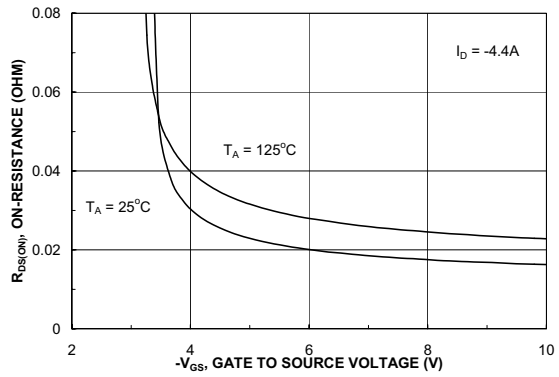Temperature.

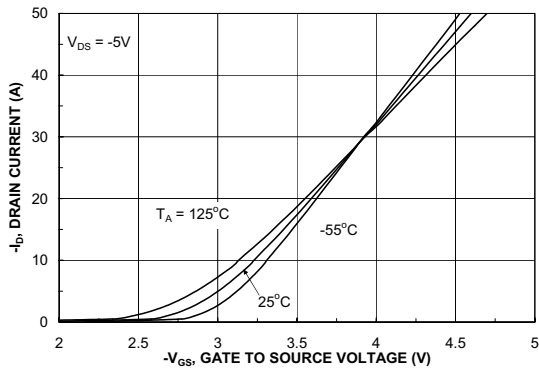Figure 4. On-Resistance Variation with
Gate-to-Source Voltage.

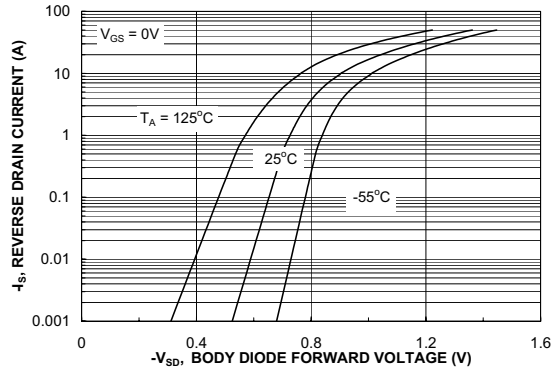Figure 5. Transfer Characteristics.

Figure 6. Body Diode Forward Voltage Variation
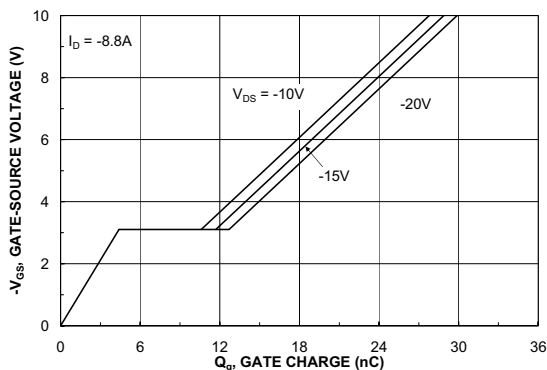with Source Current and Temperature.

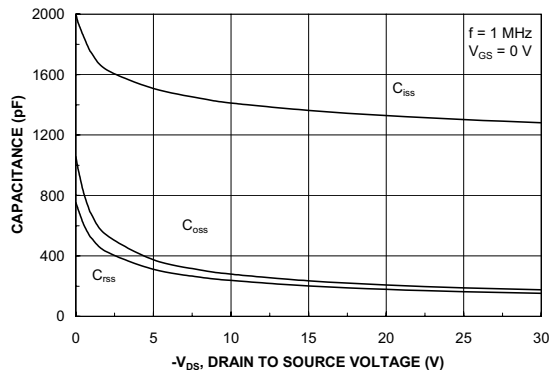## Typical Characteristics
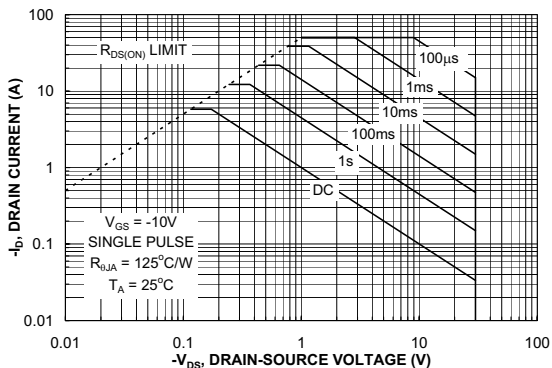

Figure 7. Gate Charge Characteristics.

Figure 8. Capacitance Characteristics.

Figure 9. Maximum Safe Operating Area.
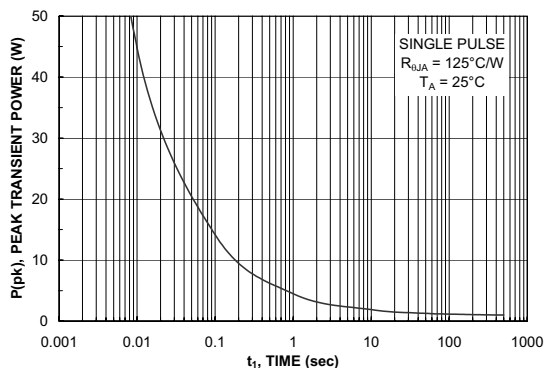
Figure 10. Single Pulse Maximum Power Dissipation.
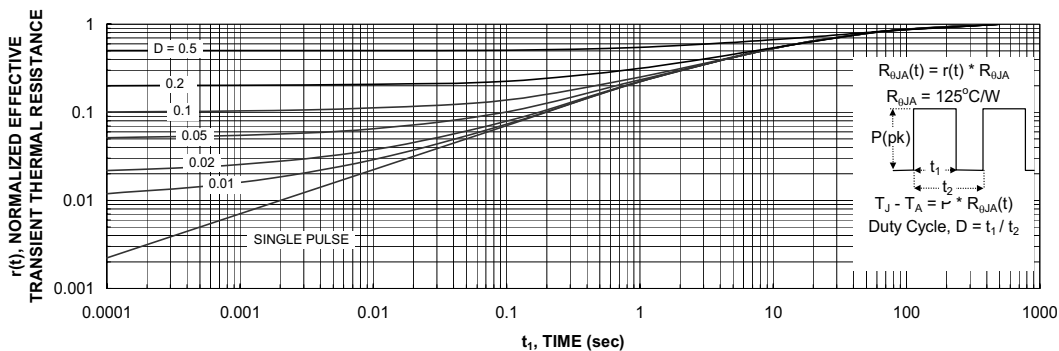
Figure 11. Transient Thermal Response Curve.

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

PUBLICATION ORDERING INFORMATION

❖ © Semiconductor Components Industries, LLC

www.onsemi.com

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET *category:*

Click to view products by ON Semiconductor *manufacturer:*

Other Similar products are found below :

614233C 648584F IRFD120 JANTX2N5237 FCA20N60_F109 FDZ595PZ 2SK2545(Q,T) 405094E 423220D TPCC8103,L1Q(CM
MIC4420CM-TR VN1206L SBVS138LT1G 614234A 715780A NTNS3166NZT5G SSM6J414TU,LF(T 751625C BUK954R8-60E
NTE6400 SQJ402EP-T1-GE3 2SK2614(TE16L1,Q) 2N7002KW-FAI DMN1017UCP3-7 EFC2J004NUZTDG ECH8691-TL-W
FCAB21350L1 P85W28HP2F-7071 DMN1053UCP4-7 NTE221 NTE222 NTE2384 NTE2903 NTE2941 NTE2945 NTE2946 NTE2960
NTE2967 NTE2969 NTE2976 NTE455 NTE6400A NTE2910 NTE2916 NTE2956 NTE2911 DMN2080UCB4-7 TK10A80W,S4X(S
SSM6P69NU,LF DMP22D4UFO-7B