FDN335N

General Description

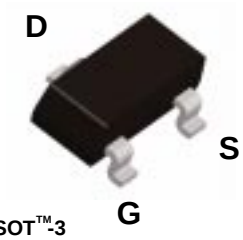
This N-Channel 2.5V specified MOSFET is produced using Fairchild Semiconductor's advanced PowerTrench process that has been especially tailored to minimize the on-state resistance and yet maintain low gate charge for superior switching performance.

Applications

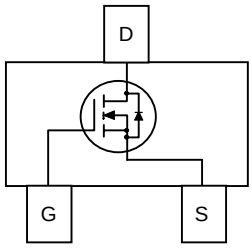
- DC/DC converter
- Load switch

Features

- 1.7 A, 20 V. $R_{DS(ON)}$ = 0.07 Ω @ V_{GS} = 4.5 V
  $R_{DS(ON)}$ = 0.100 Ω @ V_{GS} = 2.5 V.
- Low gate charge (3.5nC typical).
- High performance trench technology for extremely low $R_{DS(ON)}$.
- High power and current handling capability.



SuperSOT™-3



Absolute Maximum Ratings T_A = 25°C unless otherwise noted

Symbol	Parameter		Ratings	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±8	V
I_D	Drain Current - Continuous	(Note 1a)	1.7	A
	- Pulsed		8	
P_D	Power Dissipation for Single Operation	(Note 1a)	0.5	W
		(Note 1b)	0.46	
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)	250	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	(Note 1)	75	°C/W

Package Outlines and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
335	FDN335N	7''	8mm	3000 units

FDN335N

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	20			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA,Referenced to 25°C		14		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 16 V, V_{GS} = 0 V			1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 8 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -8 V, V_{DS} = 0 V			-100	nA
On Characteristics (Note 2)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	0.4	0.9	1.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	I_D = 250 μA,Referenced to 25°C		-3		mV/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 4.5 V, I_D = 1.7 A V_{GS} = 4.5 V, I_D = 1.7 A,T_J = 125°C V_{GS} = 2.5 V, I_D = 1.5 A		0.055 0.079 0.078	0.070 0.120 0.100	Ω
$I_{D(on)}$	On-State Drain Current	V_{GS} = 4.5 V, V_{DS} = 5 V	8			A
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 1.5 A		7		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 10 V, V_{GS} = 0 V, f = 1.0 MHz		310		pF
C_{oss}	Output Capacitance			80		pF
C_{rss}	Reverse Transfer Capacitance			40		pF
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 10 V, I_D = 1 A, V_{GS} = 4.5 V, R_{GEN} = 6 Ω		5	15	ns
t_r	Turn-On Rise Time			8.5	17	ns
$t_{d(off)}$	Turn-Off Delay Time			11	20	ns
t_f	Turn-Off Fall Time			3	10	ns
Q_g	Total Gate Charge	V_{DS} = 10 V, I_D = 1.7 A, V_{GS} = 4.5 V,		3.5	5	nC
Q_{gs}	Gate-Source Charge			0.55		nC
Q_{gd}	Gate-Drain Charge			0.95		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current				0.42	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 0.42 A (Note 2)		0.7	1.2	V

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) 250°C/W when mounted on a 0.02 in^2 Pad of 2 oz. Cu.

b) 270°C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

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