

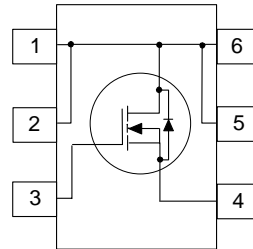
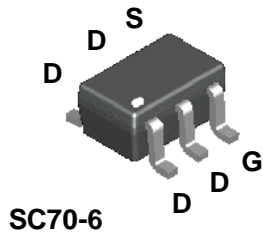
FDG315N

Applications

- DC/DC converter
- Load switch
- Power Management

Features

- 2 A, 30 V. $R_{DS(ON)} = 0.12 \Omega @ V_{GS} = 10 \text{ V}$
 $R_{DS(ON)} = 0.16 \Omega @ V_{GS} = 4.5 \text{ V}$.
- Low gate charge (2.1nC typical).
- High performance trench technology for extremely low $R_{DS(ON)}$.
- Compact industry standard SC70-6 surface mount package.



Absolute Maximum Ratings T_A = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V _{DSS}	Drain-Source Voltage	30	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Drain Current - Continuous (Note 1a) - Pulsed	2	A
		6	
P _D	Power Dissipation for Single Operation (Note 1a) (Note 1b)	0.75	W
		0.48	
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics

R _{θJA}	Thermal Resistance, Junction-to-Ambient (Note 1b)	260	°C/W
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Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
.15	FDG315N	7"	8mm	3000 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	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to 25°C		26		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			1	μA
I_{GSS}	Gate-Body Leakage Forward	$V_{GS} = 16\text{ V}, V_{DS} = 0\text{ V}$			100	nA
I_{GSS}	Gate-Body Leakage Reverse	$V_{GS} = -16\text{ V}, V_{DS} = 0\text{ V}$			-100	nA

On Characteristics (Note 2)

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1	1.8	3	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to 25°C		-4		mV/ $^\circ\text{C}$
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 2\text{ A}$ $V_{GS} = 10\text{ V}, I_D = 2\text{ A}, T_J = 125^\circ\text{C}$ $V_{GS} = 4.5\text{ V}, I_D = 1.7\text{ A}$		0.100 0.140 0.130	0.12 0.20 0.16	Ω
$I_{D(on)}$	On-State Drain Current	$V_{GS} = 4.5\text{ V}, V_{DS} = 5\text{ V}$	3			A
G_{FS}	Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 2\text{ A}$		5		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		220		pF
C_{oss}	Output Capacitance			50		pF
C_{rss}	Reverse Transfer Capacitance			20		pF

Switching Characteristics (Note 2)

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 15\text{ V}, I_D = 1\text{ A},$ $V_{GS} = 10\text{ V}, R_{GEN} = 6\ \Omega$		3	6	ns
t_r	Turn-On Rise Time			11	22	ns
$t_{d(off)}$	Turn-Off Delay Time			7	14	ns
t_f	Turn-Off Fall Time			3	6	ns
Q_g	Total Gate Charge	$V_{DS} = 15\text{ V}, I_D = 2\text{ A},$ $V_{GS} = 5\text{ V}$		2.1	4	nC
Q_{gs}	Gate-Source Charge			0.8		nC
Q_{gd}	Gate-Drain Charge			0.7		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	$V_{GS} = 0\text{ V}, I_S = 0.42\text{ A}$ (Note 2)		0.7	1.2	V

Notes:

- $R_{\theta JA}$ 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.
 - 170°C/W when mounted on a 1 in^2 pad of 2oz copper.
 - 260°C/W when mounted on a minimum pad.
- Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$