

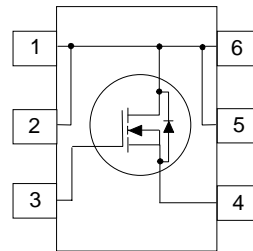
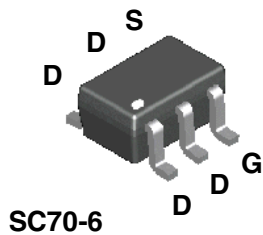
FDG311N

Applications

- Load switch
- Power management
- DC/DC converter

Features

- 1.9 A, 20 V. $R_{DS(ON)} = 0.115 \Omega @ V_{GS} = 4.5 \text{ V}$
 $R_{DS(ON)} = 0.150 \Omega @ V_{GS} = 2.5 \text{ V}$.
- Low gate charge (3nC typical).
- High performance trench technology for extremely low $R_{DS(ON)}$.
- Compact industry standard SC70-6 surface mount package.



Absolute Maximum Ratings $T_A = 25 \text{ C}$ 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) - Pulsed	1.9	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	$^{\circ}\text{C}$

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1b)	260	$^{\circ}\text{C/W}$
-----------------	---	-----	----------------------

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
.11	FDG311N	7	8mm	3000 units



FDG311N

Electrical Characteristics

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	20			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to 25°C		14		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$			1	μA
I_{GSS}	Gate-Body Leakage Forward	$V_{GS} = 8\text{ V}, V_{DS} = 0\text{ V}$			100	nA
I_{GSS}	Gate-Body Leakage Reverse	$V_{GS} = -8\text{ V}, V_{DS} = 0\text{ V}$			-100	nA
On Characteristics (Note 2)						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.4	0.9	1.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to 25°C		-3		mV/ $^\circ\text{C}$
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 4.5\text{ V}, I_D = 1.9\text{ A}$ $V_{GS} = 4.5\text{ V}, I_D = 1.9\text{ A}, T_J = 125^\circ\text{C}$ $V_{GS} = 2.5\text{ V}, I_D = 1.6\text{ A}$		0.082 0.110 0.105	0.115 0.170 0.150	Ω
$I_{D(on)}$	On-State Drain Current	$V_{GS} = 4.5\text{ V}, V_{DS} = 5\text{ V}$	4			A
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 0.5\text{ A}$		6		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$		270		pF
C_{oss}	Output Capacitance			55		pF
C_{rss}	Reverse Transfer Capacitance			20		pF
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 10\text{ V}, I_D = 1\text{ A}, V_{GS} = 5\text{ V}, R_{GEN} = 6\ \Omega$		5	12	ns
t_r	Turn-On Rise Time			9	17	ns
$t_{d(off)}$	Turn-Off Delay Time			10	18	ns
t_f	Turn-Off Fall Time			2	6	ns
Q_g	Total Gate Charge	$V_{DS} = 10\text{ V}, I_D = 1.9\text{ A}, V_{GS} = 4.5\text{ V}$		3	4.5	nC
Q_{gs}	Gate-Source Charge			0.6		nC
Q_{gd}	Gate-Drain Charge			0.9		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:

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) 170°C/W when mounted on a 1 in^2 pad of 2oz copper.
- b) 260°C/W when mounted on a minimum pad.

2. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$