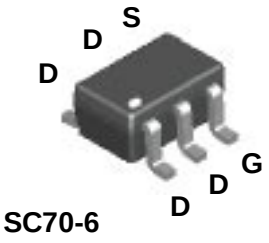
FDG312P

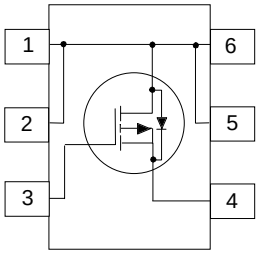
- -1.2 A, -20 V. $R_{DS(on)}$ = 0.18 Ω @ V_{GS} = -4.5 V
  $R_{DS(on)}$ = 0.25 Ω @ V_{GS} = -2.5 V.
- Low gate charge (3.3 nC typical).
- High performance trench technology for extremely low $R_{DS(ON)}$.
- Compact industry standard SC70-6 surface mount package.

Applications

- Load switch
- Battery protection
- Power management



SC70-6



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 1)	-1.2	A
	- Pulsed		-6	
P_D	Power Dissipation for Single Operation	(Note 1a)	0.75	W
		(Note 1b)	0.55	
		(Note 1c)	0.48	
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 1)	260	°C/W

Package Outlines and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
.12	FDG312P	7''	8mm	3000 units

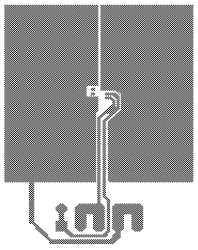
DMOS Electrical Characteristics

T_A = 25°C unless otherwise noted

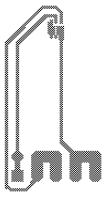
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = -250 μA	-20			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = -250 μA, Referenced to 25°C		-19		mV/°C
I_{DSS}	Zero Gate Voltage 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		2.5		mV/°C
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = -4.5 V, I_D = -1.2 A V_{GS} = -4.5 V, I_D = -1.2 A @125°C V_{GS} = -2.5 V, I_D = -1 A		0.135 0.200 0.187	0.18 0.29 0.25	Ω
$I_{D(on)}$	On-State Drain Current	V_{GS} = -4.5 V, V_{DS} = -5 V	-3			A
g_{FS}	Forward Transconductance	V_{DS} = -5 V, I_D = -1.2 A		3.8		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = -10 V, V_{GS} = 0 V, f = 1.0 MHz		330		pF
C_{oss}	Output Capacitance			80		pF
C_{rss}	Reverse Transfer Capacitance			35		pF
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = -5 V, I_D = -0.5 A, V_{GS} = -4.5 V, R_{GEN} = 6 Ω		7	15	ns
t_r	Turn-On Rise Time			12	22	ns
$t_{d(off)}$	Turn-Off Delay Time			16	26	ns
t_f	Turn-Off Fall Time			5	12	ns
Q_g	Total Gate Charge	V_{DS} = -10 V, I_D = -1.2 A, V_{GS} = -4.5 V		3.3	5	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				-0.6	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = -0.6 A (Note 2)		-0.83	-1.2	V

Notes:

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient 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 $R_{\theta JA}$ is determined by the user's board design.



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



b) 225°C/W when mounted on a half of package sized 2oz. copper.

c) 260°C/W when mounted on a minimum pad of 2oz copper.

Scale 1 : 1 on letter size paper

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