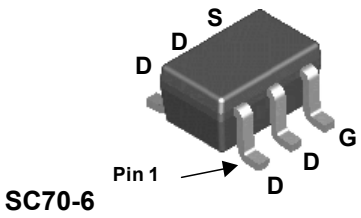
FDG330P

Features

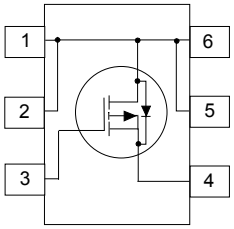
- –2 A, –12 V. $R_{DS(ON)}$ = 110 mΩ @ V_{GS} = –4.5 V
  $R_{DS(ON)}$ = 150 mΩ @ V_{GS} = –2.5 V
  $R_{DS(ON)}$ = 215 mΩ @ V_{GS} = –1.8 V
- Low gate charge
- High performance trench technology for extremely low $R_{DS(ON)}$
- Compact industry standard SC70-6 surface mount package

Applications

- Battery management
- Load switch



SC70-6



Absolute Maximum Ratings

T_A=25°C unless otherwise noted

Symbol	Parameter		Ratings	Units
V_{DSS}	Drain-Source Voltage		–12	V
V_{GSS}	Gate-Source Voltage		± 8	V
I_D	Drain Current – Continuous	(Note 1a)	–2	A
	– Pulsed		–6	
P_D	Power Dissipation for Single Operation	(Note 1a)	0.75	W
		(Note 1b)	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 1b)	260	°C/W

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
.30	FDG330P	7''	8mm	3000 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	–12			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = –250 μA, Referenced to 25°C		–2.7		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = –10 V, V_{GS} = 0 V			–1	μA
I_{GSSF}	Gate–Body Leakage, Forward	V_{GS} = 8 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate–Body Leakage, 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	–0.7	–1.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	I_D = –250 μA, Referenced to 25°C		2.3		mV/°C
$R_{DS(on)}$	Static Drain–Source On–Resistance	V_{GS} = –4.5 V, I_D = –2.0 A V_{GS} = –2.5 V, I_D = –1.7 A V_{GS} = –1.8 V, I_D = –1.4 A V_{GS} = –4.5 V, I_D = –2.0 A, T_J = 125°C		84 107 145 98	110 150 215 148	mΩ
$I_{D(on)}$	On–State Drain Current	V_{GS} = –4.5 V, V_{DS} = –5 V	–6			A
g_{FS}	Forward Transconductance	V_{DS} = –5 V, I_D = –2.0 A		6.8		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = –6.0 V, V_{GS} = 0 V, f = 1.0 MHz		477		pF
C_{oss}	Output Capacitance			186		pF
C_{rss}	Reverse Transfer Capacitance			124		pF
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn–On Delay Time	V_{DD} = –6.0 V, I_D = 1 A, V_{GS} = –4.5 V, R_{GEN} = 6 Ω		10	20	ns
t_r	Turn–On Rise Time			11	20	ns
$t_{d(off)}$	Turn–Off Delay Time			12	22	ns
t_f	Turn–Off Fall Time			18	32	ns
Q_g	Total Gate Charge	V_{DS} = –6.0 V, I_D = –2.0 A, V_{GS} = –4.5 V		5	7	nC
Q_{gs}	Gate–Source Charge			0.8		nC
Q_{gd}	Gate–Drain Charge			1.4		nC
Drain–Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain–Source Diode Forward Current				–0.62	A
V_{SD}	Drain–Source Diode Forward Voltage	V_{GS} = 0 V, I_S = –0.62 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 2 oz. copper.

b.) 260°C/W when mounted on a minimum pad.

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