

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



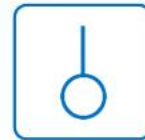
MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	FDN306P
▶ Overseas	Part Number	FDN306P-EV
▶ Equivalent	Part Number	FDN306P

EV is the abbreviation of name EVVO

P-Channel 1.8 V (D-S) MOSFET

General Description

This P-Channel 1.8V specified MOSFET uses Fairchild's advanced low voltage PowerTrench process. It has been optimized for battery power management applications.

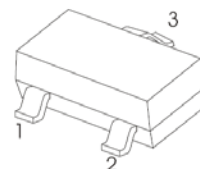
Applications

- Battery management
- Load switch
- Battery protection

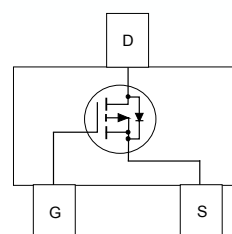
Features

- -2.6 A, -12 V. $R_{DS(ON)} = 40\text{ m}\Omega$ @ $V_{GS} = -4.5\text{ V}$
 $R_{DS(ON)} = 50\text{ m}\Omega$ @ $V_{GS} = -2.5\text{ V}$
 $R_{DS(ON)} = 80\text{ m}\Omega$ @ $V_{GS} = -1.8\text{ V}$
- Fast switching speed
- High performance trench technology for extremely low $R_{DS(ON)}$
- SuperSOT™ -3 provides low $R_{DS(ON)}$ and 30% higher power handling capability than SOT23 in the same footprint

SOT - 23



1. GATE
2. SOURCE
3. DRAIN



Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ 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) – Pulsed	-2.6	A
		-10	
P_D	Maximum Power Dissipation (Note 1a) (Note 1b)	0.5	W
		0.46	
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 1a)	250	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	75	$^\circ\text{C/W}$

P-Channel 1.8 V (D-S) MOSFET
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 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		–3		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	–0.6	–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 = –2.6 A V _{GS} = –2.5 V, I _D = –2.3 A V _{GS} = –1.8V, I _D = –1.8 A		30 39 54	40 50 80	mΩ
I _{D(on)}	On–State Drain Current	V _{GS} = –4.5 V, V _{DS} = –5 V	–10			A
g _{FS}	Forward Transconductance	V _{DS} = –5 V, I _D = –2.6 A		10		S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = –6 V, V _{GS} = 0 V,		1138		pF
C _{oss}	Output Capacitance	f = 1.0 MHz		454		pF
C _{rss}	Reverse Transfer Capacitance			302		pF
Switching Characteristics (Note 2)						
t _{d(on)}	Turn–On Delay Time	V _{DD} = –6 V, I _D = –1 A,		11	20	ns
t _r	Turn–On Rise Time	V _{GS} = –4.5 V, R _{GEN} = 6 Ω		10	20	ns
t _{d(off)}	Turn–Off Delay Time			38	61	ns
t _f	Turn–Off Fall Time			35	56	ns
Q _g	Total Gate Charge	V _{DS} = –6 V, I _D = –2.6 A,		12	17	nC
Q _{gs}	Gate–Source Charge	V _{GS} = –4.5 V		2		nC
Q _{gd}	Gate–Drain Charge			3		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 (Note 2)		–0.6	–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.


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

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

Scale 1 : 1 on letter size paper

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

P-Channel 1.8 V (D-S) MOSFET

Typical Characteristics

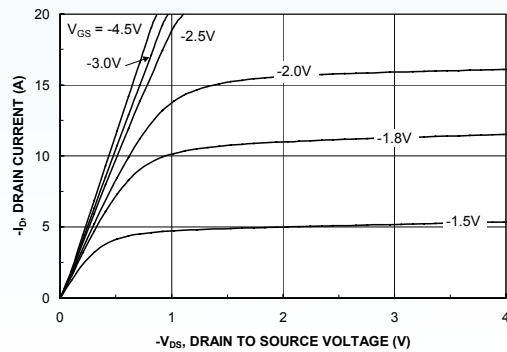


Figure 1. On-Region Characteristics.

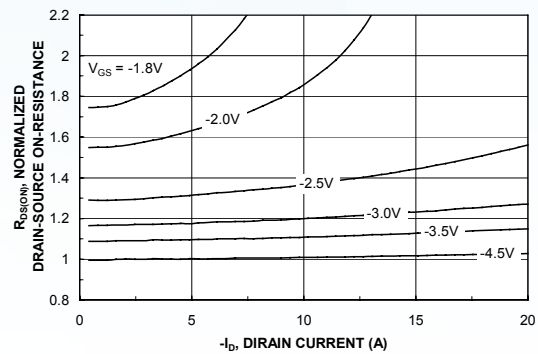


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

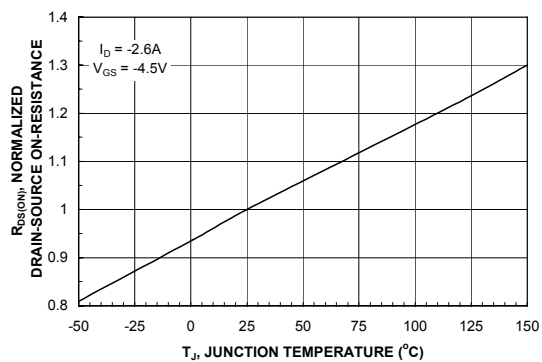


Figure 3. On-Resistance Variation with Temperature.

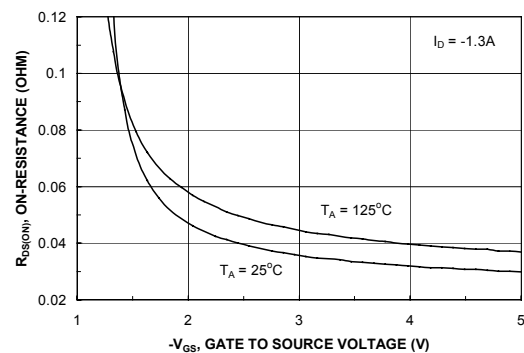


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

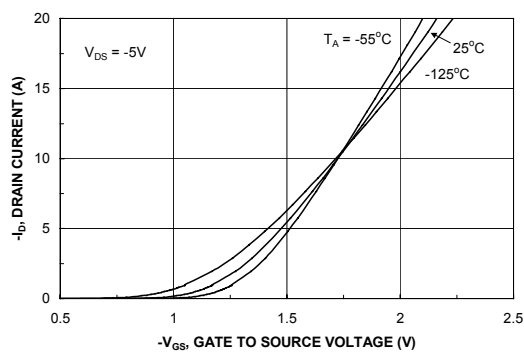


Figure 5. Transfer Characteristics.

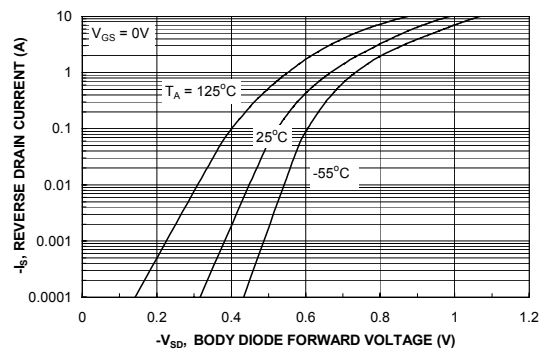


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

P-Channel 1.8 V (D-S) MOSFET

Typical Characteristics

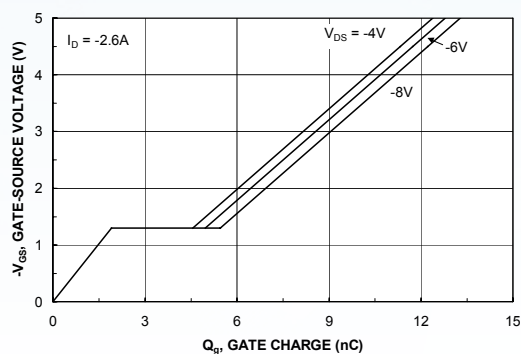


Figure 7. Gate Charge Characteristics.

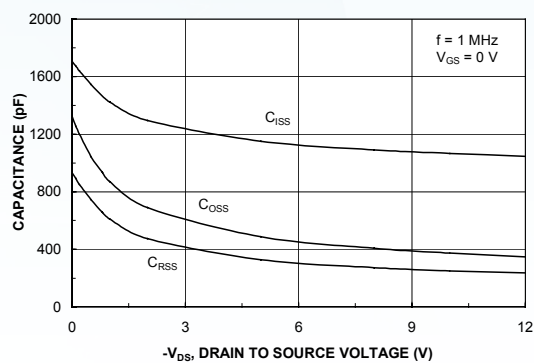


Figure 8. Capacitance Characteristics.

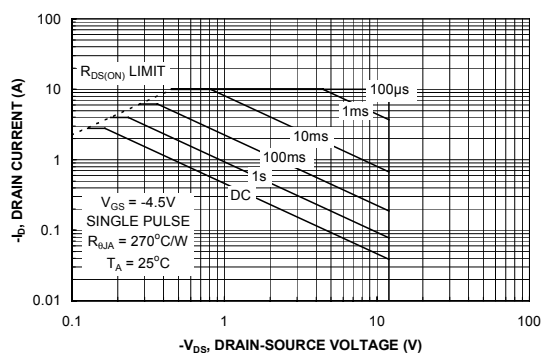


Figure 9. Maximum Safe Operating Area.

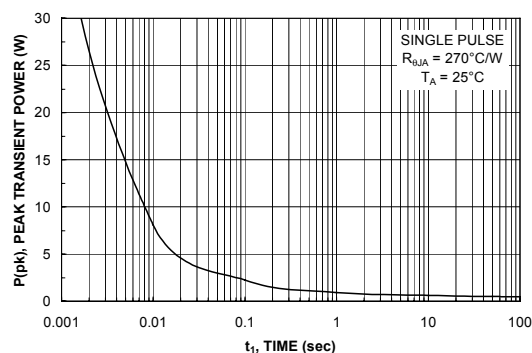


Figure 10. Single Pulse Maximum Power Dissipation.

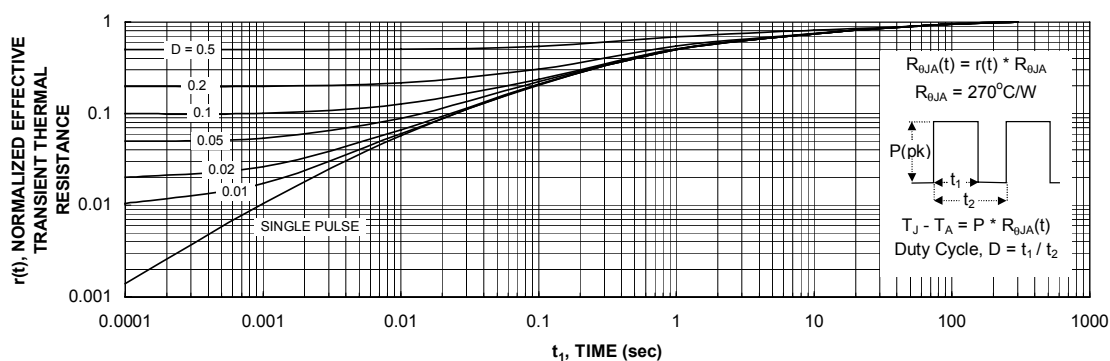
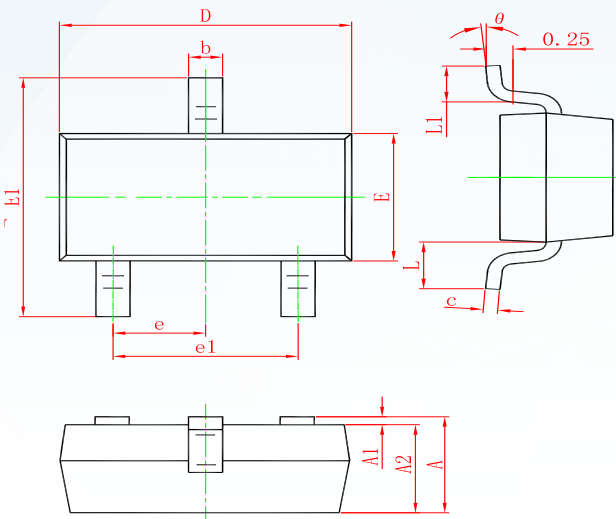


Figure 11. Transient Thermal Response Curve.

Thermal characterization performed using the conditions described in Note 1b.
 Transient thermal response will change depending on the circuit board design.

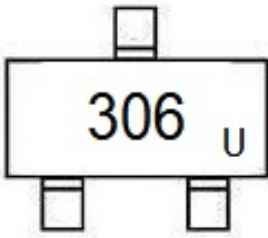
P-Channel 1.8 V (D-S) MOSFET

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
FDN306P	SOT-23	3000	Tape and reel

Disclaimer

EVVOSEMI ("EVVO") reserves the right to make corrections, enhancements, improvements, and other changes to its products and services at any time, and to discontinue any product or service without notice.

EVVO warrants the performance of its hardware products to the specifications applicable at the time of sale in accordance with its standard warranty. Testing and other quality control techniques are used as deemed necessary by EVVO to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Customers should obtain and confirm the latest product information and specifications before final design, purchase, or use. EVVO makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does EVVO assume any liability for application assistance or customer product design. EVVO does not warrant or accept any liability for products that are purchased or used for any unintended or unauthorized application.

EVVO products are not authorized for use as critical components in life support devices or systems without the express written approval of EVVOSEMI.

The EVVO logo and EVVOSEMI are trademarks of EVVOSEMI or its subsidiaries in relevant jurisdictions. EVVO reserves the right to make changes without further notice to any products herein.