

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	FDN336P
▶ Overseas	Part Number	FDN336P-EV
▶ Equivalent	Part Number	FDN336P

EV is the abbreviation of name EVVO

P-Channel 2.5 V (D-S) MOSFET

General Description

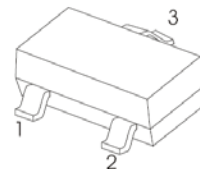
This P-Channel 2.5V specified MOSFET has been especially tailored to minimize the on-state resistance and yet maintain low gate charge for superior switching performance.

These devices are well suited for portable electronics applications: load switching and power management, battery charging circuits and DC/DC conversion.

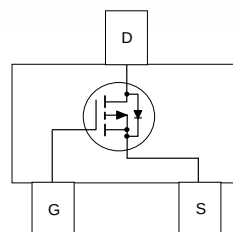
Features

- $V_{DS} (V) = -20V$
- $R_{DS(ON)} < 91m\ \Omega$ ($V_{GS} = -4.5V$)
- $R_{DS(ON)} < 108m\ \Omega$ ($V_{GS} = -2.5V$)

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	-20	V
V_{GSS}	Gate-Source Voltage	± 8	V
I_D	Drain Current – Continuous (Note 1a) – Pulsed	-1.3	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 2.5 V (D-S) MOSFET

Electrical Characteristics (T_A = 25 °C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = -250 μA	-20			V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	I _D = -250 μA, Referenced to 25 °C		-16		mV / °C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -16 V, V _{GS} = 0 V			-1	μA
		T _J = 55°C			-10	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	-0.9	-1.5	V
ΔV _{GS(th)} /ΔT _J	Gate Threshold Voltage Temp. Coefficient	I _D = -250 μA, Referenced to 25 °C		3		mV / °C
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = -4.5 V, I _D = -1.3 A		88	91	mΩ
		V _{GS} = -2.5 V, I _D = -1.1 A		103	108	
I _{D(on)}	On-State Drain Current	V _{GS} = -4.5 V, V _{DS} = -5 V	-5			A
g _{FS}	Forward Transconductance	V _{DS} = -4.5 V, I _D = -2 A		4		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 = -2 A, V _{GS} = -4.5 V		3.6	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				-0.42	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = -0.42 A (Note)		-0.7	-1.2	V

Note:

1. R_{θJA} 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_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design.



a. 250°C/W when mounted on
a 0.02 in² pad of 2oz Cu.



b. 270°C/W when mounted on
a 0.001 in² pad of 2oz Cu.

Scale 1 : 1 on letter size paper

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

P-Channel 2.5 V (D-S) MOSFET

Typical Electrical Characteristics

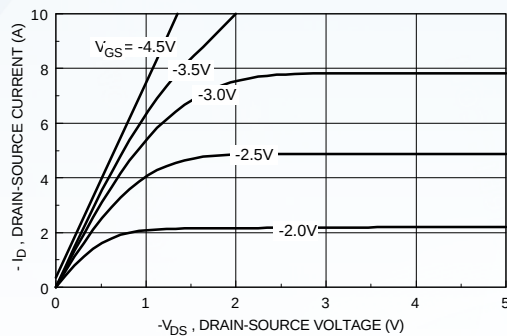


Figure 1. On-Region Characteristics.

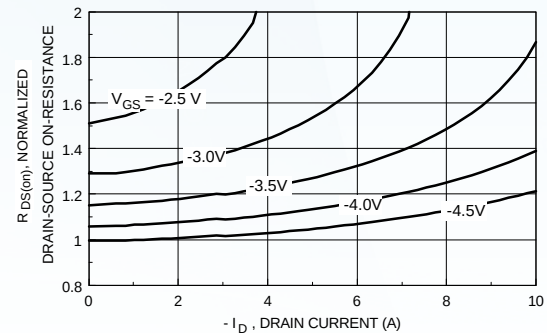


Figure 2. On-Resistance Variation with Drain Current and Gate

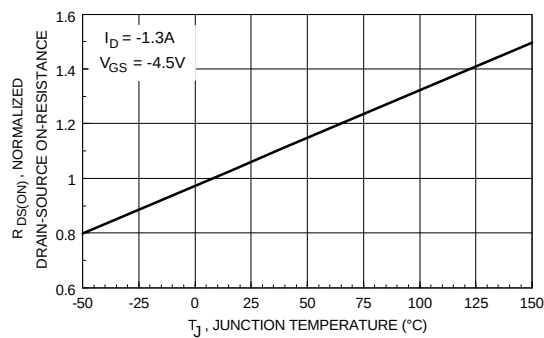


Figure 3. On-Resistance Variation with Temperature.

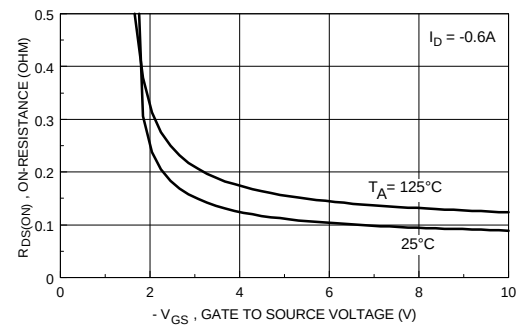


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

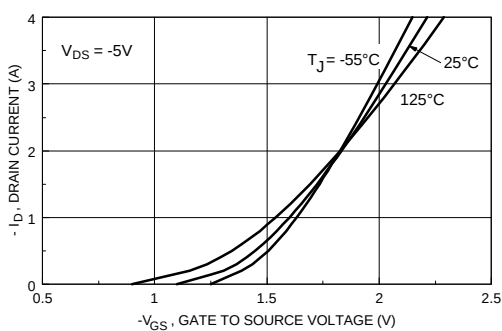


Figure 5. Transfer Characteristics.

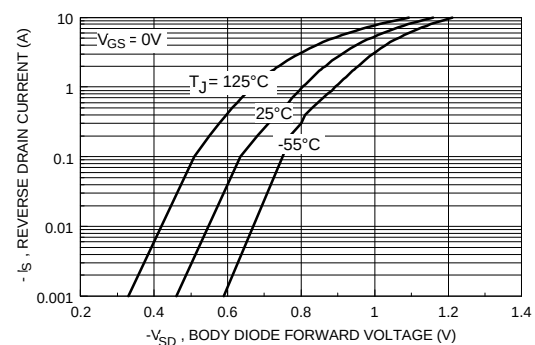


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

P-Channel 2.5 V (D-S) MOSFET

Typical Electrical Characteristics (continued)

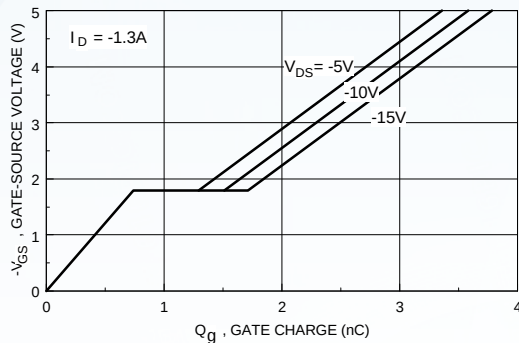


Figure 7. Gate Charge Characteristics.

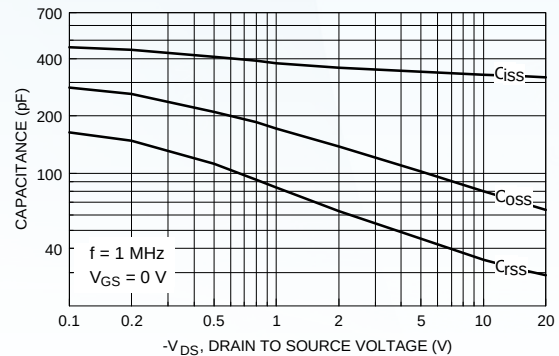


Figure 8. Capacitance Characteristics.

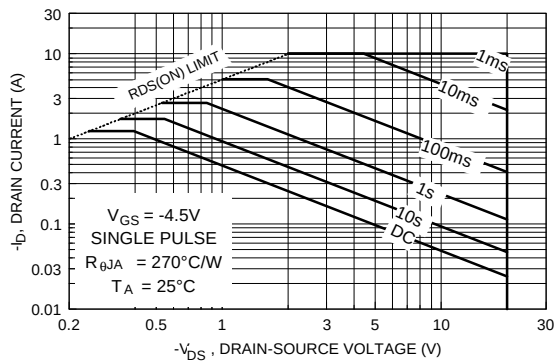


Figure 9. Maximum Safe Operating Area.

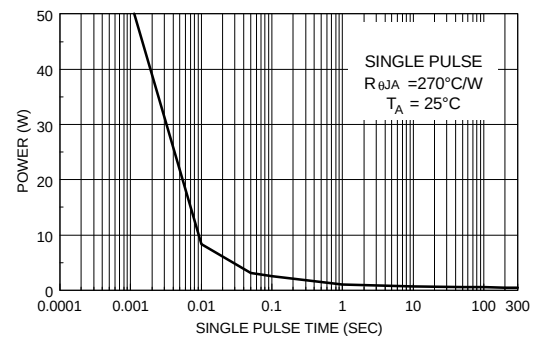


Figure 10. Single Pulse Maximum Power Dissipation.

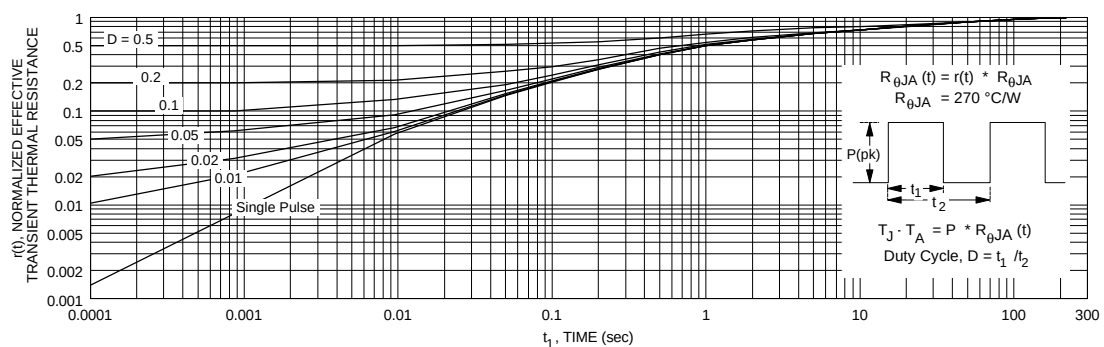
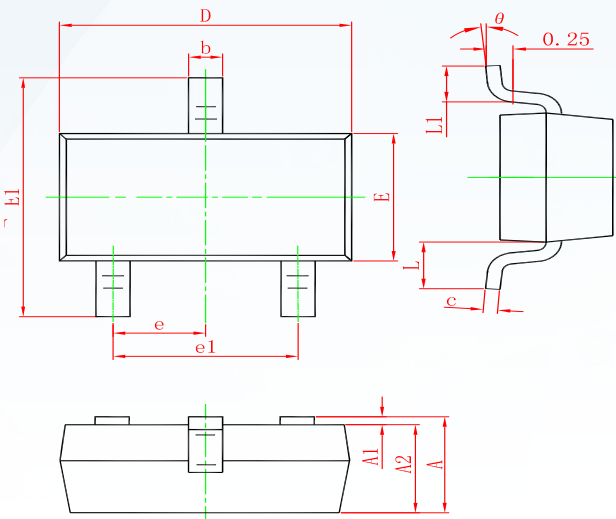


Figure 11. Transient Thermal Response Curve.

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

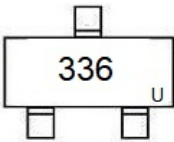
P-Channel 2.5 V (D-S) MOSFET

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
FDN336P	SOT-23	3000	Tape and reel

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