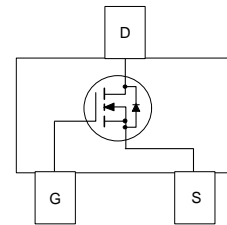
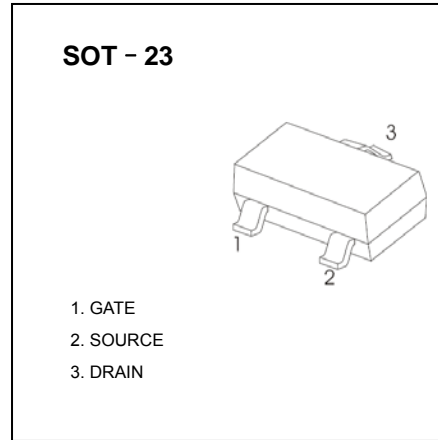


**General Description**

These devices are particularly suited for low voltage applications in notebook computers, portable phones, PCMCIA cards, and other battery powered circuits where fast switching, and low in-line power loss are needed in a very small outline surface mount package.

**Features**

- $V_{DS} (V) = 30V$
- $I_D = 2.2A (V_{GS}=4.5V)$
- $R_{DS(ON)} < 65m\Omega (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 82m\Omega (V_{GS} = 2.5V)$
- High density cell design for extremely low  $R_{DS(ON)}$ .
- Exceptional on-resistance and maximum DC current capability.



**Absolute Maximum Ratings**  $T_A = 25^\circ C$  unless other wise noted

Symbol	Parameter	FDN337N	Units
$V_{DSS}$	Drain-Source Voltage	30	V
$V_{GSS}$	Gate-Source Voltage - Continuous	$\pm 8$	V
$I_D$	Drain/Output Current - Continuous - Pulsed	2.2	A
		10	
$P_D$	Maximum Power Dissipation (Note 1a) (Note 1b)	0.5	W
		0.46	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 150	$^\circ C$
<b>THERMAL CHARACTERISTICS</b>			
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	250	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	75	$^\circ C/W$

### Electrical Characteristics (T<sub>A</sub> = 25 °C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient	I <sub>D</sub> = 250 μA, Referenced to 25 °C		41		mV/°C
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V			1	μA
		T <sub>J</sub> = 55°C			10	μA
I <sub>GSSF</sub>	Gate - Body Leakage, Forward	V <sub>GS</sub> = 8 V, V <sub>DS</sub> = 0 V			100	nA
I <sub>GSSR</sub>	Gate - Body Leakage, Reverse	V <sub>GS</sub> = -8 V, V <sub>DS</sub> = 0 V			-100	nA
<b>ON CHARACTERISTICS</b> (Note)						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.4	0.7	1	V
ΔV <sub>GS(th)</sub> /ΔT <sub>J</sub>	Gate Threshold Voltage Temp. Coefficient	I <sub>D</sub> = 250 μA, Referenced to 25 °C		-2.3		mV/°C
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 2.2 A		54	65	mΩ
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 2 A		70	82	
I <sub>D(on)</sub>	On-State Drain Current	V <sub>GS</sub> = 4.5 V, V <sub>DS</sub> = 5 V	10			A
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 2.2 A		13		S
<b>DYNAMIC CHARACTERISTICS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0 V, f = 1.0 MHz		300		pF
C <sub>oss</sub>	Output Capacitance			145		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			35		pF
<b>SWITCHING CHARACTERISTICS</b> (Note)						
t <sub>D(on)</sub>	Turn - On Delay Time	V <sub>DD</sub> = 5 V, I <sub>D</sub> = 1 A, V <sub>GS</sub> = 4.5 V, R <sub>GEN</sub> = 6 Ω		4	10	ns
t <sub>r</sub>	Turn - On Rise Time			10	18	ns
t <sub>D(off)</sub>	Turn - Off Delay Time			17	28	ns
t <sub>f</sub>	Turn - Off Fall Time			4	10	ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 2.2 A, V <sub>GS</sub> = 4.5 V		7	9	nC
Q <sub>gs</sub>	Gate-Source Charge			1.1		nC
Q <sub>gd</sub>	Gate-Drain Charge			1.9		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				0.42	A
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 0.42 A (Note)		0.65	1.2	V

Note:

1. R<sub>θJA</sub> 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<sub>θJC</sub> is guaranteed by design while R<sub>θCA</sub> is determined by the user's board design.

Typical R<sub>θJA</sub> using the board layouts shown below on FR-4 PCB in a still air environment :

Scale 1 : 1 on letter size paper

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



a. 250°C/W when mounted on  
0.02 in<sup>2</sup> pad of 2oz Cu.



b. 270°C/W when mounted on  
a 0.001 in<sup>2</sup> pad of 2oz Cu.

Typical Electrical Characteristics

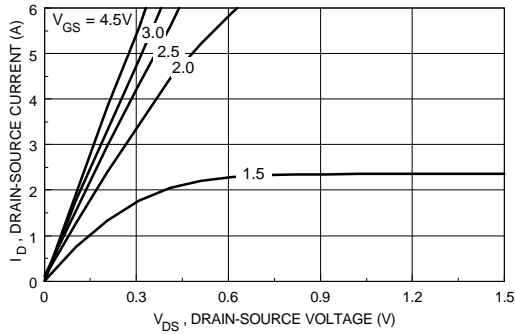


Figure 1. On-Region Characteristics.

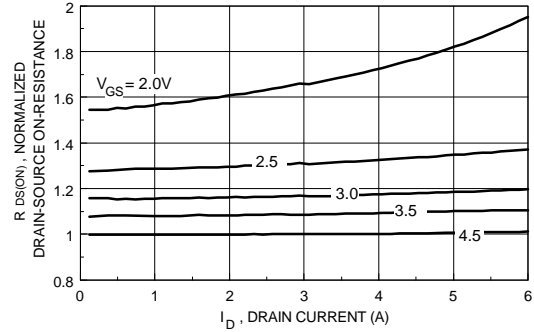


Figure 2. On-Resistance Variation with Drain Current and Gate

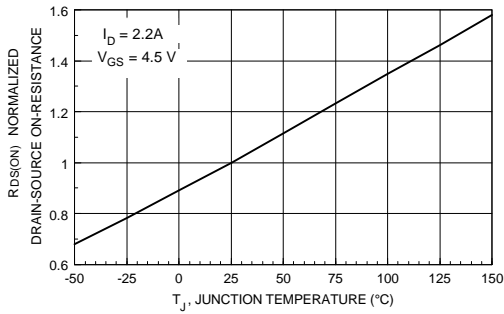


Figure 3. On-Resistance Variation with Temperature.

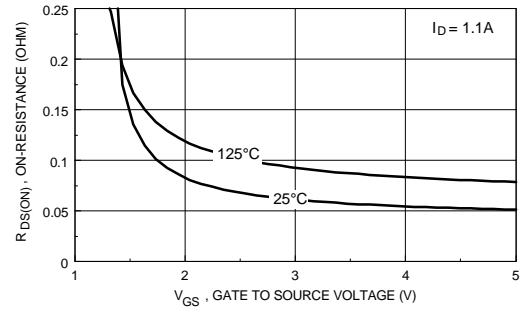


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

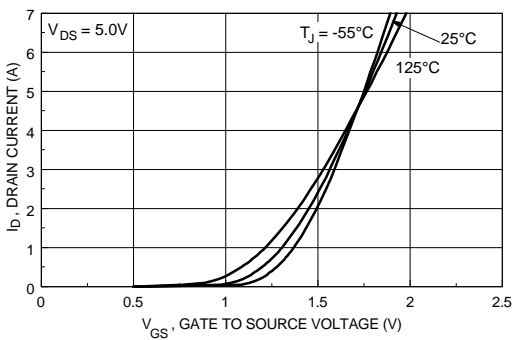
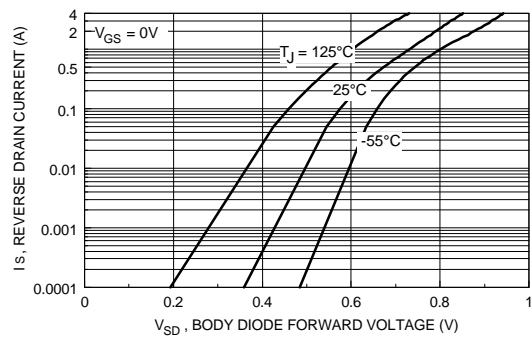


Figure 5. Transfer Characteristics.



Typical Electrical Characteristics (continued)

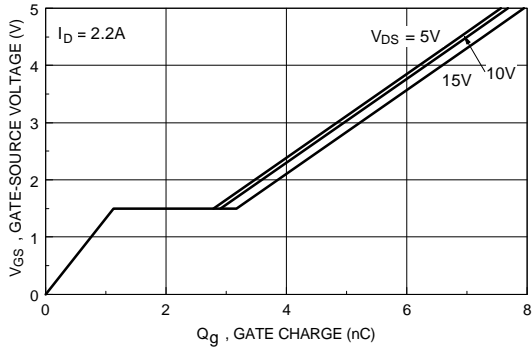


Figure 7. Gate Charge Characteristics.

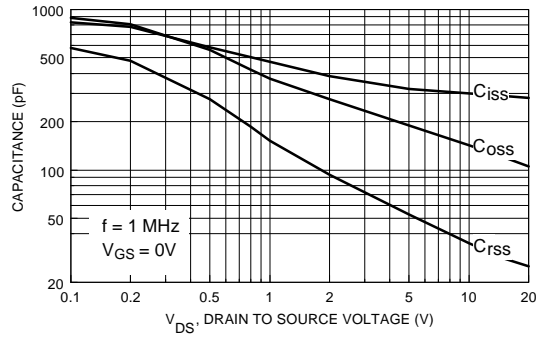


Figure 8. Capacitance Characteristics.

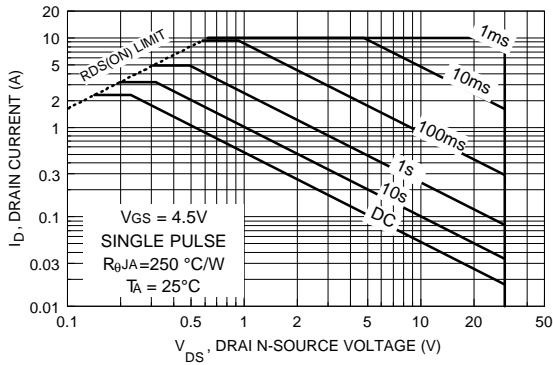


Figure 9. Maximum Safe Operating Area.

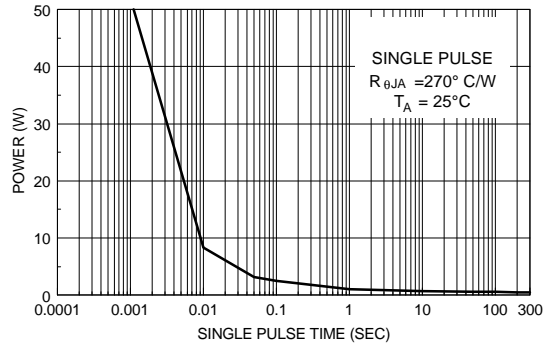


Figure 10. Single Pulse Maximum Power Dissipation.

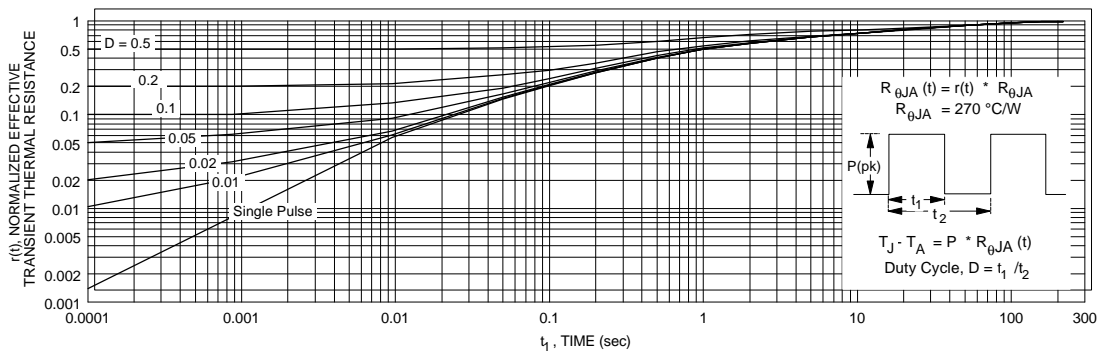
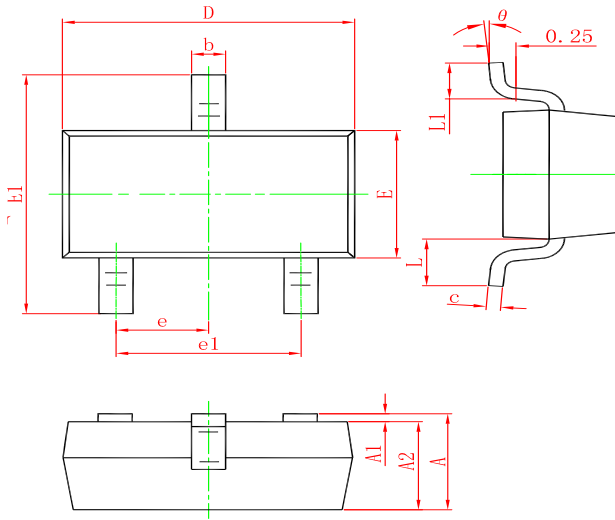


Figure 11. Transient Thermal Response Curve.

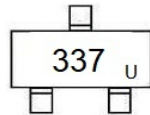
Thermal characterization performed using the conditions described in note 1b.  
Transient thermal response will change depending on the circuit board design.

**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
UMW FDN337N	SOT-23	3000	Tape and reel