

## 20V P-Channel Power MOSFET

### UM8516 SOT23-6

#### General Description

The UM8516 is a low threshold P-channel MOSFET with gate to source TVS protection, have extremely low on-resistance. This benefit provides the designer with an extremely efficient device for use in battery and load management applications. The devices use a space-saving, small-outline SOT23-6 package.

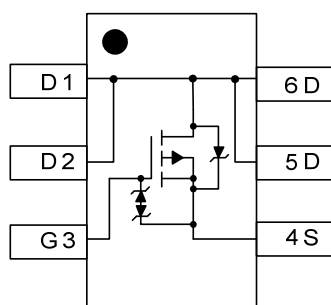
#### Applications

- Battery Packs
- Battery-Powered Portable Equipment
- Cellular and Cordless Telephones

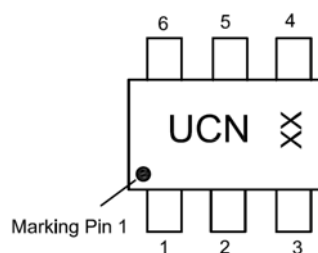
#### Features

- Drain-Source Voltage (Max): -20V
- Low On-Resistance:  
65mΩ@V<sub>GS</sub>=-4.5V  
75mΩ@V<sub>GS</sub>=-2.5V
- Continuous Drain Current (Max): -4A@25°C

#### Pin Configurations



#### Top View



**XX: Week Code**  
**UM8516**  
**SOT23-6**

#### Ordering Information

Part Number	Packaging Type	Marking Code	Shipping Qty
UM8516	SOT23-6	UCN	3000pcs/7 Inch Tape & Reel

#### Absolute Maximum Ratings

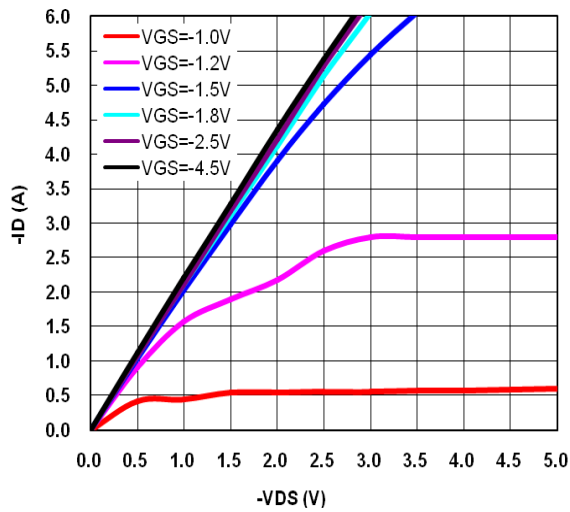
Symbol	Parameter	Value	Units
V <sub>DSS</sub>	Drain-Source Voltage	-20	V
V <sub>GS</sub>	Gate-Source Voltage	±8	V
I <sub>D</sub>	Continuous Drain Current	-4.0	A
I <sub>DM</sub>	Drain Current Pulsed	-20	A
P <sub>D</sub>	Power Dissipation	0.7	W
T <sub>J</sub>	Junction Temperature	-55~150	°C
T <sub>stg</sub>	Storage Temperature	-55~150	°C
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	100	°C/W

**Electrical Characteristics**

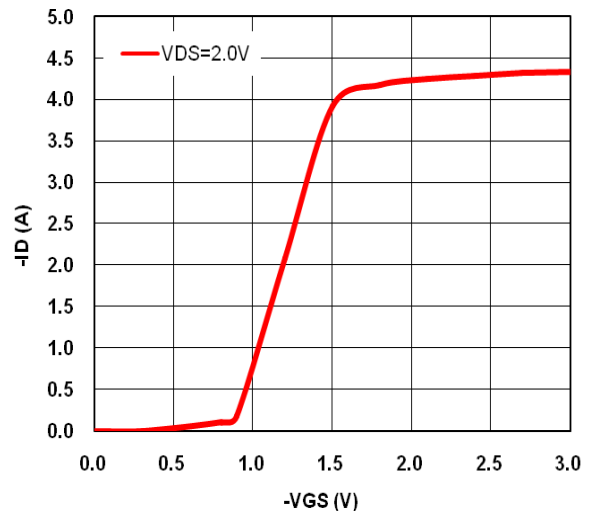
 (T<sub>J</sub>=25°C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
BV <sub>DSS</sub>	Drain to Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V			-1	μA
I <sub>GSS</sub>	Gate-to-Source Leakage Current	V <sub>GS</sub> =±6V, V <sub>DS</sub> =0V			±10	μA
<b>On Characteristics</b>						
R <sub>DS(ON)</sub>	Static Drain-to-Source On-Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.0A		52	65	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4.0A		60	75	
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.4	-0.6	-1	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-2.7A		9		S
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1.0MHz		990		pF
C <sub>oss</sub>	Output Capacitance			92		
C <sub>rss</sub>	Reverse Transfer Capacitance			15		
<b>Switching Characteristics</b>						
Q <sub>g(TH)</sub>	Threshold Gate Charge	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.2A		10.8		nC
Q <sub>gs</sub>	Gate-Source Charge			2.46		
Q <sub>gd</sub>	Gate-Drain Charge			2.41		
td(on)	Turn-on Delay Time	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A R <sub>L</sub> =10Ω, R <sub>G</sub> =2.8Ω		48		ns
tr	Rise Time			95		
td(off)	Turn-off Delay Time			680		
tf	Fall Time			250		
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
V <sub>SD</sub>	Forward Diode Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A		-0.7	-1.4	V

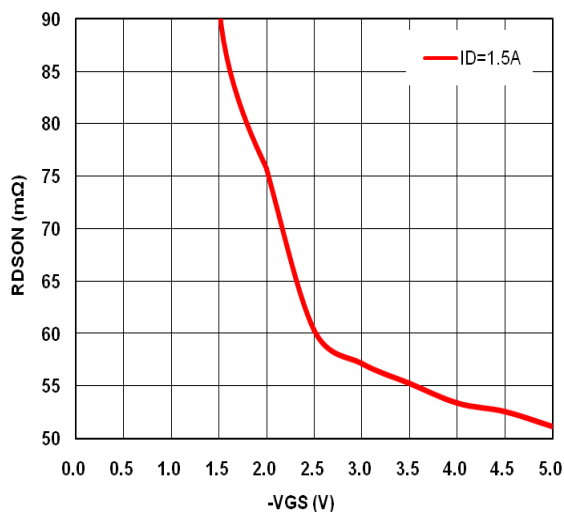
**Typical Characteristics** ( $T_J=25^\circ\text{C}$ , unless otherwise noted)



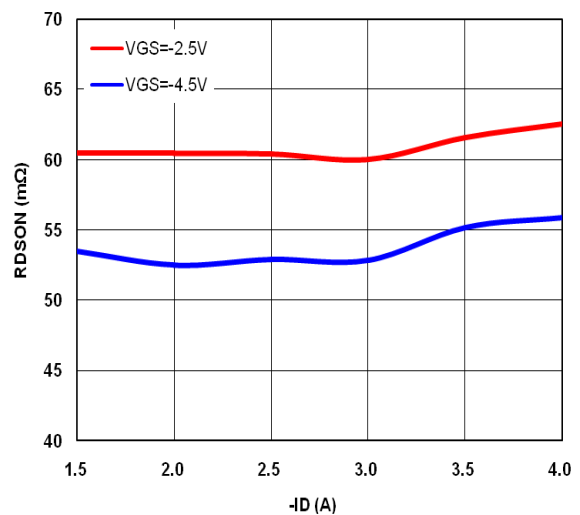
**Fig1. Typical Output Characteristics**



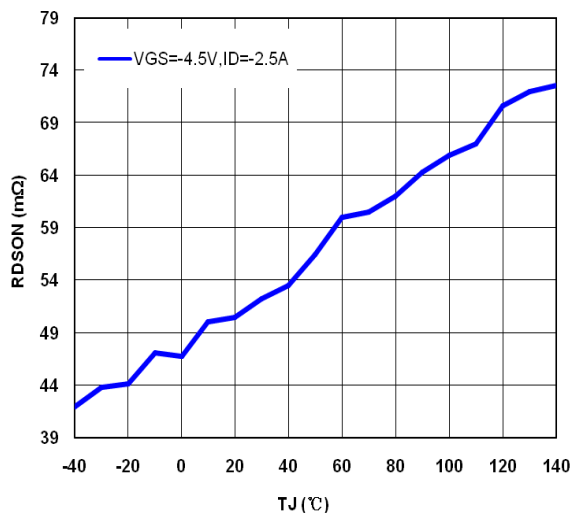
**Fig2. Typical Transfer Characteristics**



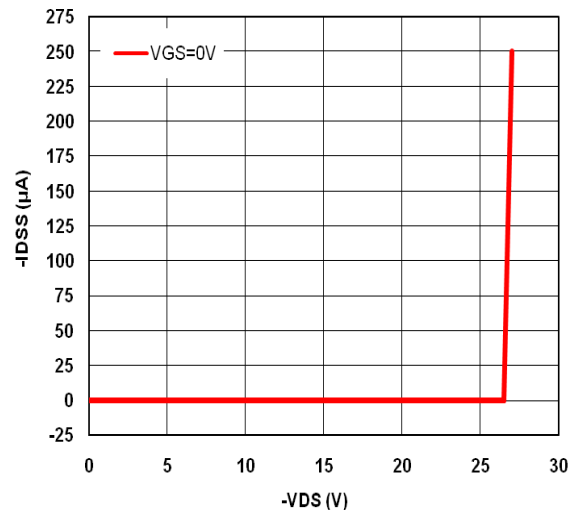
**Fig3. On-Resistance vs. Gate-to-Source Voltage**



**Fig4. On-Resistance vs. Drain Current**



**Fig5. On-Resistance vs. Junction Temperature**

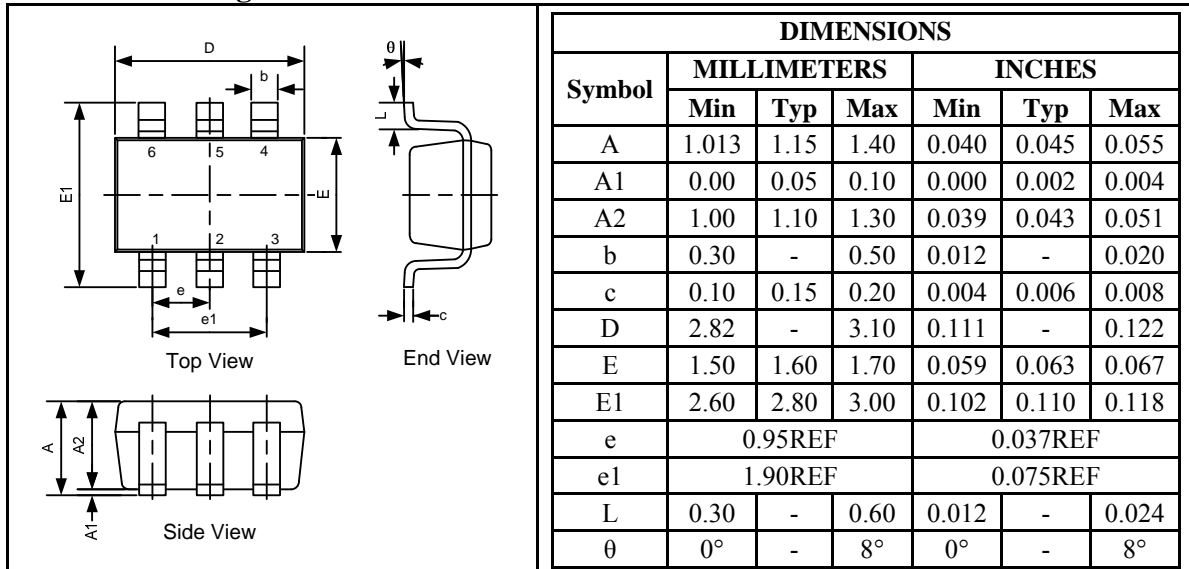


**Fig6. IDS vs. Drain-to-Source Voltage**

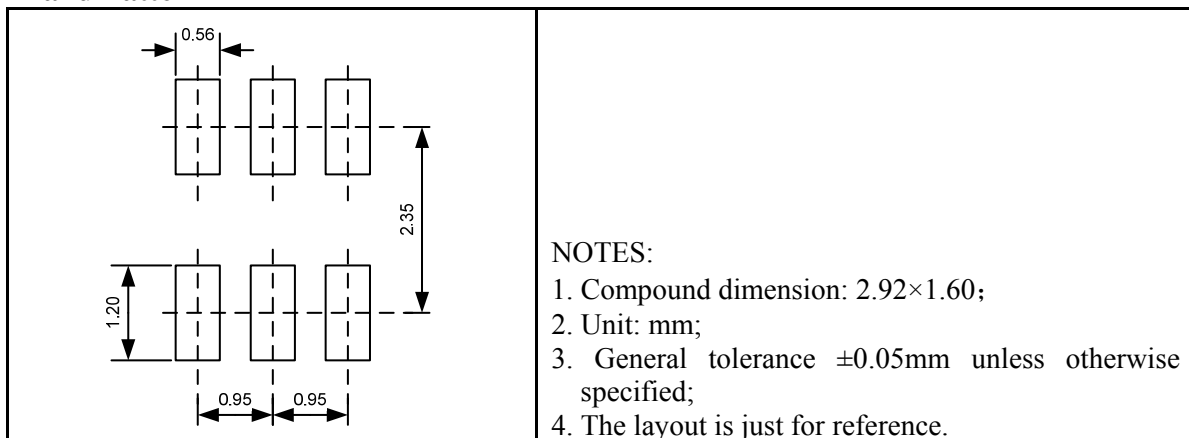
## Package Information

### UM8516 SOT23-6

#### Outline Drawing



#### Land Pattern



#### Tape and Reel Orientation



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