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

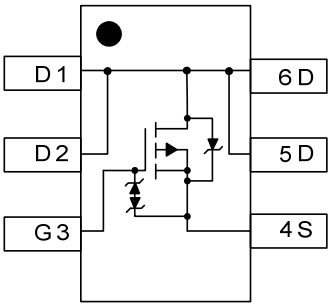
- Battery Packs
- Battery-Powered Portable Equipment
- Cellular and Cordless Telephones

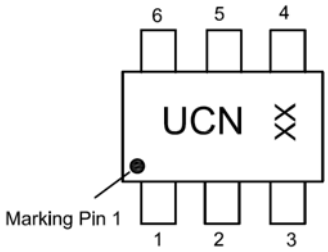
Features

- Drain-Source Voltage (Max): -20V
- Low On-Resistance:
  65mΩ@V_{GS}=-4.5V
  75mΩ@V_{GS}=-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_{DSS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±8	V
I_D	Continuous Drain Current	-4.0	A
I_{DM}	Drain Current Pulsed	-20	A
P_D	Power Dissipation	0.7	W
T_J	Junction Temperature	-55~150	°C
Tstg	Storage Temperature	-55~150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	°C/W

Electrical Characteristics
(T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-20V, V_{GS}=0V			-1	μA
I_{GSS}	Gate-to-Source Leakage Current	V_{GS}=±6V, V_{DS}=0V			±10	μA
On Characteristics						
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	V_{GS}=-4.5V, I_D=-4.0A		52	65	mΩ
		V_{GS}=-2.5V, I_D=-4.0A		60	75	
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=-250μA	-0.4	-0.6	-1	V
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-2.7A		9		S
Dynamic Characteristics						
Ciss	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1.0MHz		990		pF
Coss	Output Capacitance			92		
Crss	Reverse Transfer Capacitance			15		
Switching Characteristics						
$Q_{g(TH)}$	Threshold Gate Charge	V_{DS}=-10V, V_{GS}=-4.5V, I_D=-4.2A		10.8		nC
Qgs	Gate-Source Charge			2.46		
Qgd	Gate-Drain Charge			2.41		
td(on)	Turn-on Delay Time	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-1A R_L=10Ω, R_G=2.8Ω		48		ns
tr	Rise Time			95		
td(off)	Turn-off Delay Time			680		
tf	Fall Time			250		
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Forward Diode Voltage	V_{GS}=0V, I_S=-1A		-0.7	-1.4	V

Typical Characteristics (T_J=25°C, unless otherwise noted)

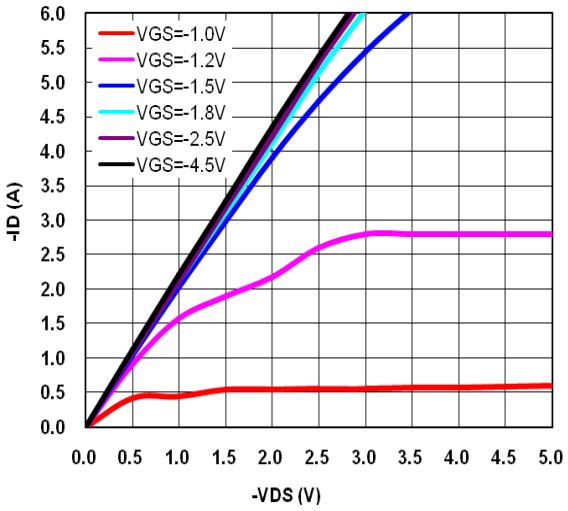


Fig1. Typical Output Characteristics

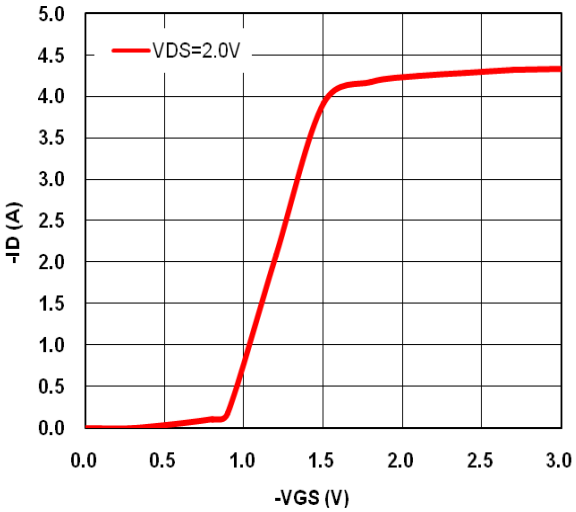


Fig2. Typical Transfer Characteristics

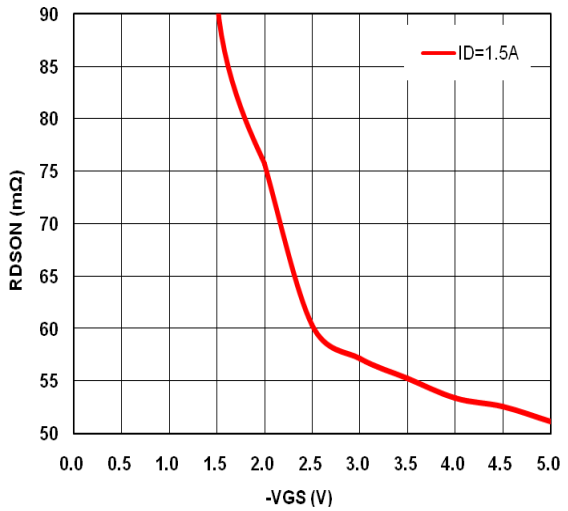


Fig3. On-Resistance vs. Gate-to-Source Voltage

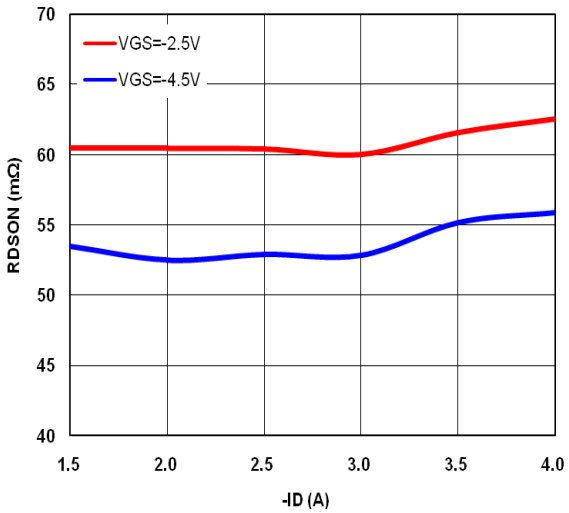


Fig4. On-Resistance vs. Drain Current

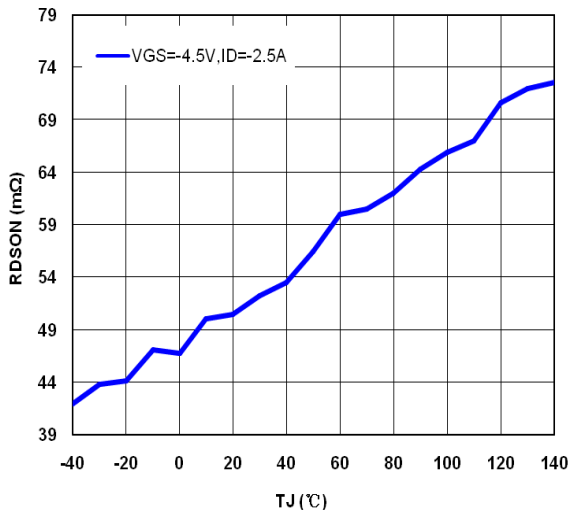


Fig5. On-Resistance vs. Junction Temperature

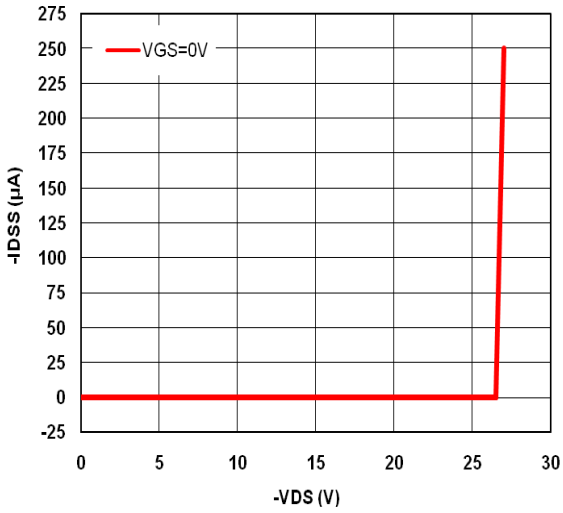
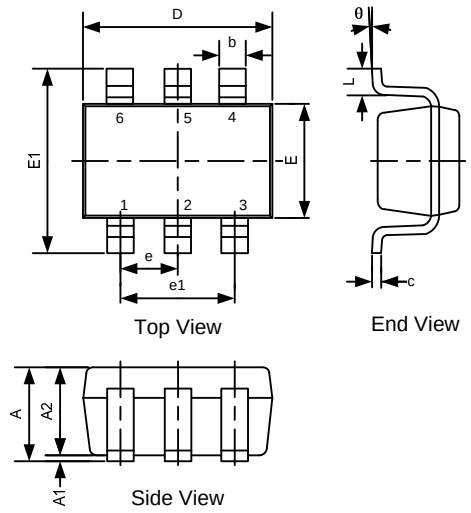


Fig6. IDS vs. Drain-to-Source Voltage

Package Information

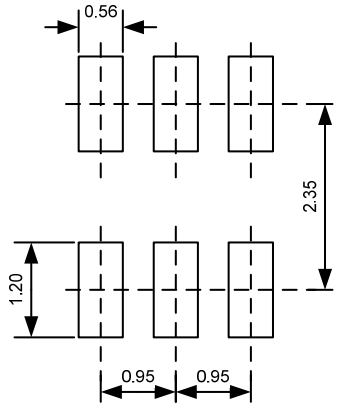
UM8516 SOT23-6

Outline Drawing



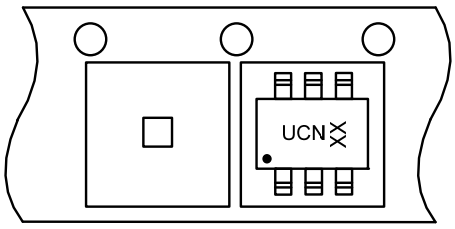
Symbol	DIMENSIONS					
	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.013	1.15	1.40	0.040	0.045	0.055
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
b	0.30	-	0.50	0.012	-	0.020
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.82	-	3.10	0.111	-	0.122
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	2.60	2.80	3.00	0.102	0.110	0.118
e	0.95REF			0.037REF		
e1	1.90REF			0.075REF		
L	0.30	-	0.60	0.012	-	0.024
θ	0°	-	8°	0°	-	8°

Land Pattern



NOTES:
1. Compound dimension: 2.92×1.60；
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



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