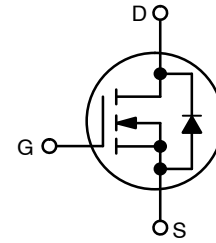


Description

These miniature surface mount MOSFETs low $R_{DS(on)}$ assure minimal power loss and conserve energy, making these devices ideal for use in space sensitive power management circuitry. Typical applications are dc-dc converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.



Features

- $V_{DS(V)} = 30V$
- $I_D = 2.1A$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 80m\Omega$ ($V_{GS}=10V$)
- $R_{DS(ON)} < 125m\Omega$ ($V_{GS}=4.5V$)

MAXIMUM RATINGS ($T_J = 25^\circ C$ unless otherwise noted)

Parameter			Symbol	Value	Unit
Drain - to - Source Voltage			V_{DSS}	30	V
Gate - to - Source Voltage			V_{GS}	± 20	V
Continuous Drain Current $R_{\theta JL}$	Steady State	$T_A = 25^\circ C$	I_D	2.1	A
		$T_A = 85^\circ C$		1.5	
Power Dissipation $R_{\theta JL}$	Steady State	$T_A = 25^\circ C$	P_D	0.69	W
Continuous Drain Current (Note 1)	Steady State	$T_A = 25^\circ C$	I_D	1.6	A
		$T_A = 85^\circ C$		1.2	
Power Dissipation (Note 1)		$T_A = 25^\circ C$	P_D	0.42	W
Pulsed Drain Current	$t_p = 10 \mu s$		I_{DM}	6.0	A
ESD Capability (Note 3)	C = 100 pF, RS = 1500 Ω		ESD	125	V
Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to 150	$^\circ C$
Source Current (Body Diode)			I_S	2.1	A
Lead Temperature for Soldering Purposes (1/8" from case for 10 sec)			T_L	260	$^\circ C$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Foot - Steady State	$R_{\theta JL}$	180	°C/W
Junction-to-Ambient - Steady State (Note 1)	$R_{\theta JA}$	300	
Junction-to-Ambient - $t < 10$ s (Note 1)	$R_{\theta JA}$	250	
Junction-to-Ambient - Steady State (Note 2)	$R_{\theta JA}$	400	

1. Surface-mounted on FR4 board using 650 mm², 1 oz. Cu pad size.
2. Surface-mounted on FR4 board using 50 mm², 1 oz. Cu pad size.
3. ESD Rating Information: HBM Class 0.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage ($V_{GS} = 0$ Vdc, $I_D = 10$ μ Adc)	$V_{(BR)DSS}$	30			Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 30$ Vdc, $V_{GS} = 0$ Vdc) ($V_{DS} = 30$ Vdc, $V_{GS} = 0$ Vdc, $T_J = 125^\circ\text{C}$)	I_{DSS}			1.0 10	μ Adc
Gate-Body Leakage Current ($V_{GS} = \pm 20$ Vdc, $V_{DS} = 0$ Vdc)	I_{GSS}			± 100	nAdc
Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250$ μ Adc)	$V_{GS(th)}$	1.0	1.7	2.4	Vdc
Static Drain-to-Source On-Resistance ($V_{GS} = 10$ Vdc, $I_D = 1.2$ Adc) ($V_{GS} = 4.5$ Vdc, $I_D = 1.0$ Adc)	$r_{DS(on)}$		0.08 0.125	0.10 0.145	Ω
Input Capacitance			($V_{DS} = 5.0$ Vdc)	140	pF
Output Capacitance			($V_{DS} = 5.0$ Vdc)	100	
Transfer Capacitance			($V_{DG} = 5.0$ Vdc)	40	
Turn-On Delay Time		(V _{DD} = 15 Vdc, I _D = 1.0 Adc, R _L = 50 Ω)	$t_{d(on)}$	2.5	ns
Rise Time	t_r		1.0		
Turn-Off Delay Time	$t_{d(off)}$		16		
Fall Time	t_f		8.0		
Gate Charge (See Figure 6)	Q_T		6000		pC
Continuous Current	I_S			0.6	A
Pulsed Current	I_{SM}			0.75	
Forward Voltage (Note 5)	V_{SD}		0.8		V

4. Pulse Test: Pulse Width ≤ 300 μ s, Duty Cycle $\leq 2\%$.
5. Switching characteristics are independent of operating junction temperature.

TYPICAL ELECTRICAL CHARACTERISTICS

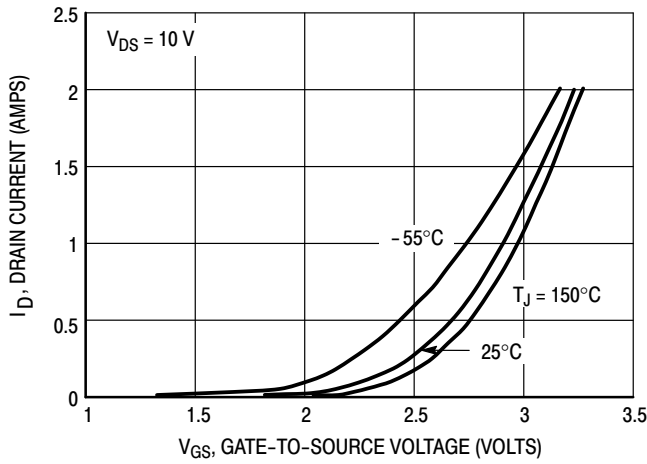


Figure 1. Transfer Characteristics

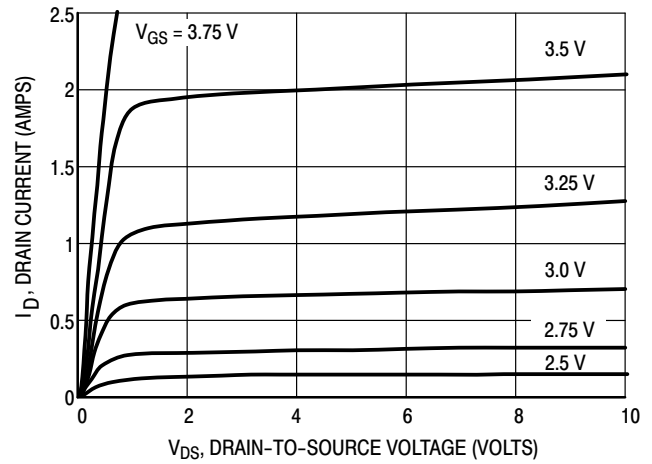


Figure 2. On-Region Characteristics

TYPICAL ELECTRICAL CHARACTERISTICS

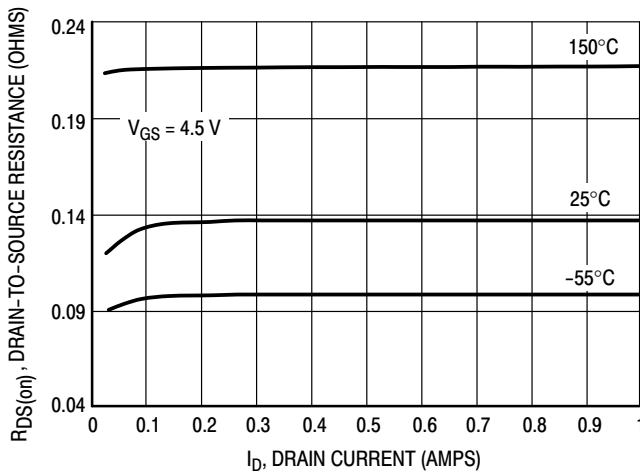


Figure 3. On-Resistance versus Drain Current

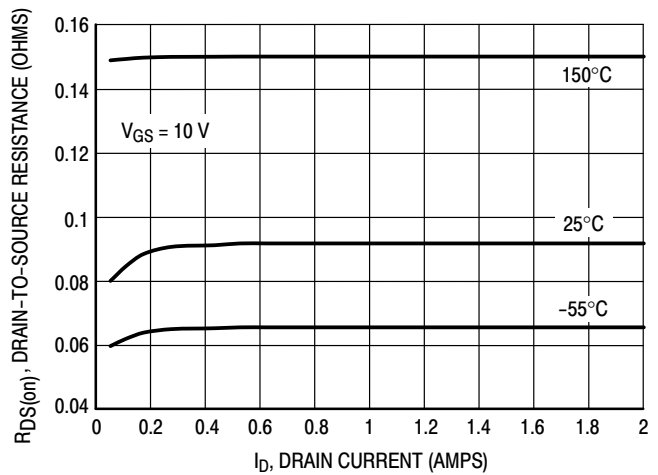


Figure 4. On-Resistance versus Drain Current

TYPICAL ELECTRICAL CHARACTERISTICS

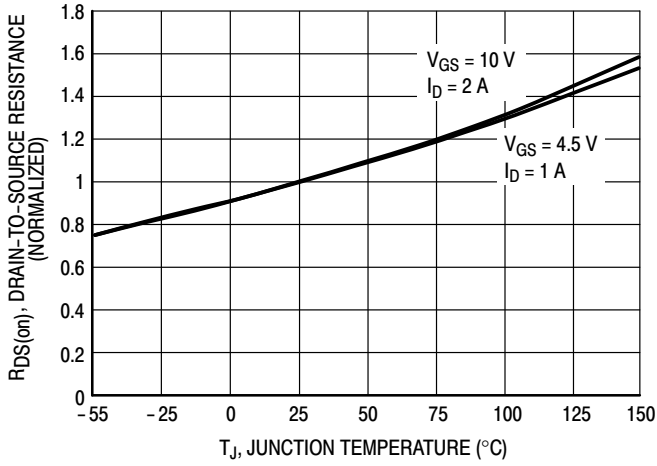


Figure 5. On-Resistance Variation with Temperature

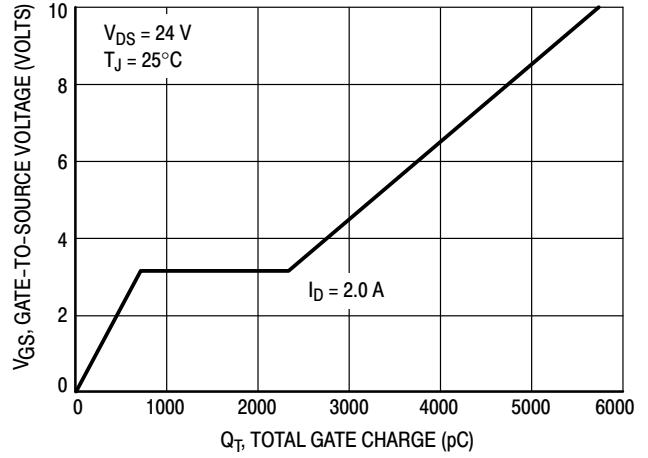


Figure 6. Gate Charge

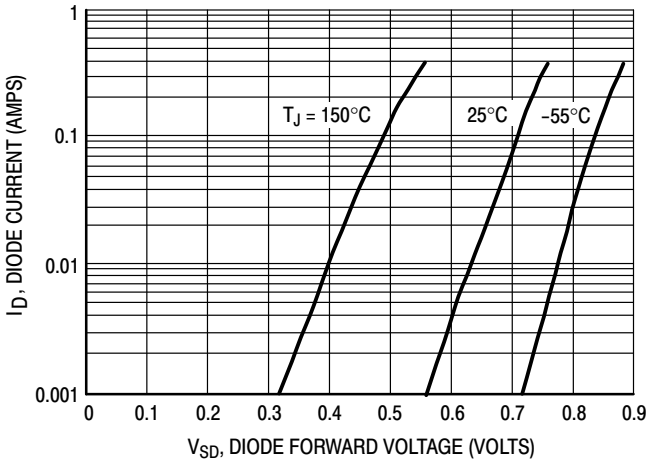


Figure 7. Body Diode Forward Voltage

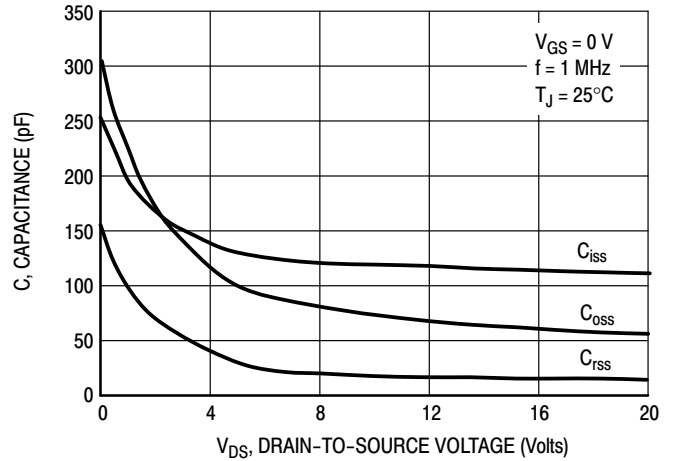


Figure 8. Capacitance

TYPICAL ELECTRICAL CHARACTERISTICS

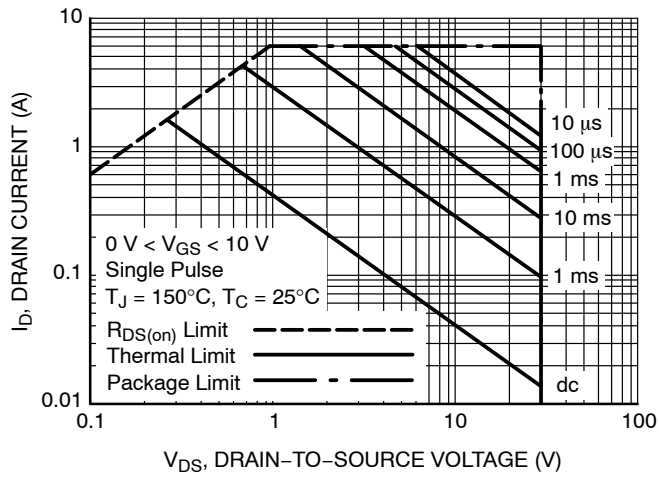


Figure 9. Maximum Rated Forward Biased Safe Operating Area

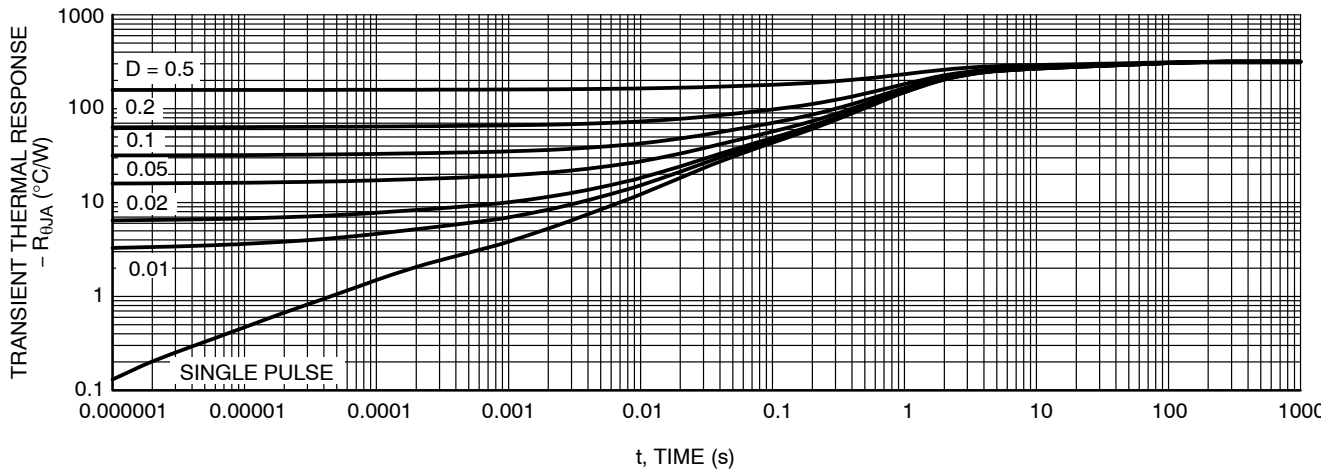
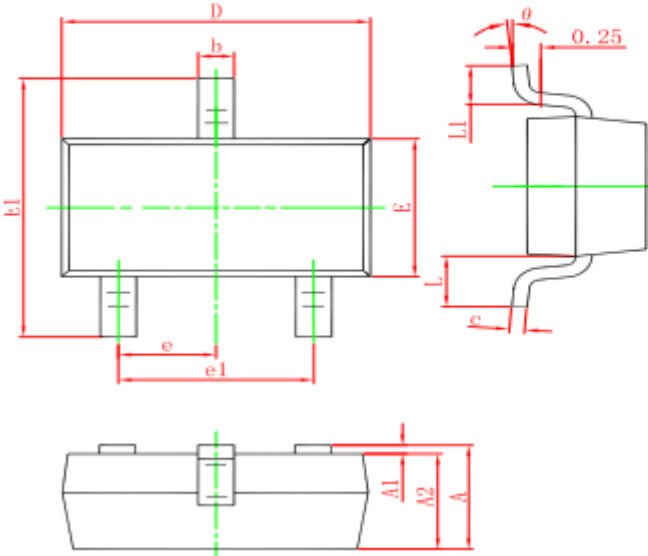


Figure 10. Thermal Response

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 MGSF1N03L	SOT-23	3000	Tape and reel