

1.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.

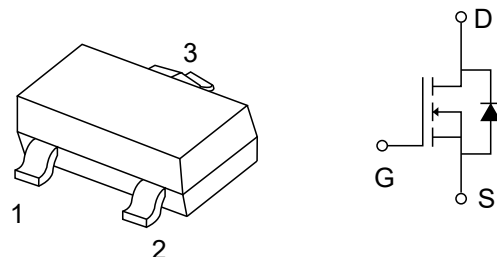
2.1Features

- $V_{DS(V)}=30V$
- $I_D=2.1A$
- $R_{DS(ON)}<0.08\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<0.125\Omega(V_{GS}=4.5V)$

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	S	SOURCE
3	D	DRAIN

SOT-23



4.Maximum ratings ($T_J=25^{\circ}C$ unless otherwise noted)

Parameter			Symbol	Value	Units
Drain – to – Source Voltage			V _{DS}	30	V
Gate – to – Source Voltage			V _{GS}	±20	
Continuous Drain Current R _{θJL}	Steady State	T _A =25°C	I _D	2.1	A
		T _A =85°C		1.5	
Power Dissipation R _{θJL}	Steady State	T _A =25°C	P _D	0.69	W
Continuous Drain Current (Note 1)	Steady State	T _A =25°C	I _D	1.6	A
		T _A =85°C		1.2	
Power Dissipation (Note 1)			T _A =25°C	P _D	0.42
Pulsed Drain Current	t _p =10μs		I _{DM}	6	A
ESD Capability (Note 3)	C=100pF, R _S =1500Ω		ESD	125	V
Operating Junction and Storage Temperature			T _J , T _{STG}	-55 to 150	°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	°C



5.Thermal Resistance Rating

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

- 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.



6. Electrical Characteristics $T_A=25^\circ\text{C}$

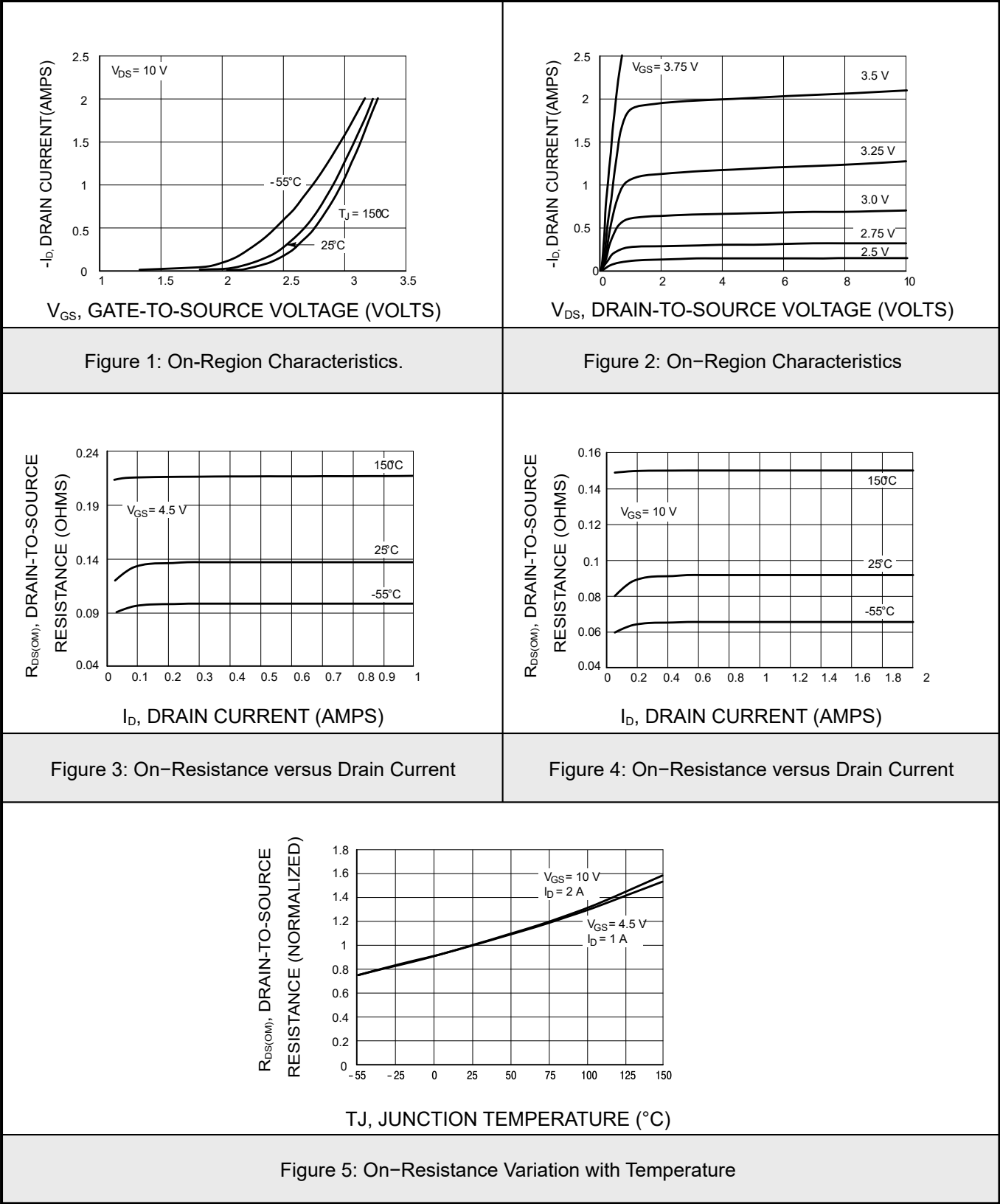
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$			1	μA
		$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^\circ\text{C}$			10	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1	1.7	2.4	V
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$, $I_D=1.2\text{A}$		0.08	0.1	Ω
		$V_{GS}=4.5\text{V}$, $I_D=1\text{A}$		0.125	0.145	
Input Capacitance	C_{iss}	$V_{DS}=5\text{V}$		140		pF
Output Capacitance	C_{oss}			100		
Transfer Capacitance	C_{rss}			40		
Turn-On Delay Time	$t_{D(on)}$	$I_D=1\text{A}$ $R_L=50\Omega$ $V_{DD}=15\text{V}$		2.5		ns
Rise Time	t_r			1		
Turn-Off Delay Time	$t_{D(off)}$			16		
Fall Time	t_f			8		
Gate Charge (See Figure 6)	Q_T			6000		pC
Continuous Current	I_S				0.6	A
Pulsed Current	I_{SM}				0.75	A
Forward Voltage (Note 5)	V_{SD}			0.8		V

4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

5. Switching characteristics are independent of operating junction temperature.



7.1Typical Characteristics





7.2 Typical Characteristics

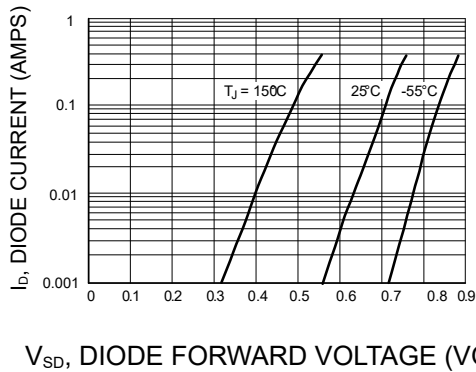


Figure 6: Body Diode Forward Voltage

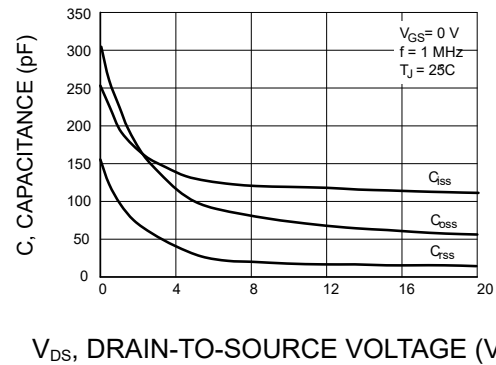


Figure 7: Capacitance

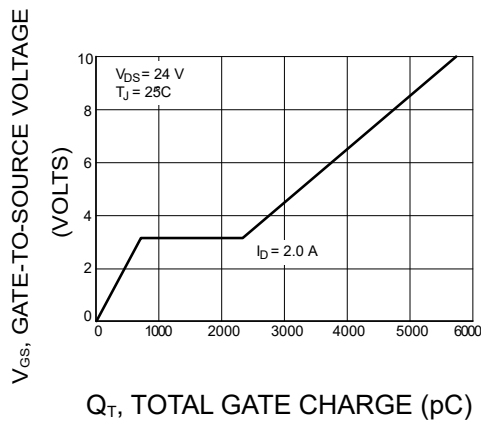


Figure 8: Gate Charge

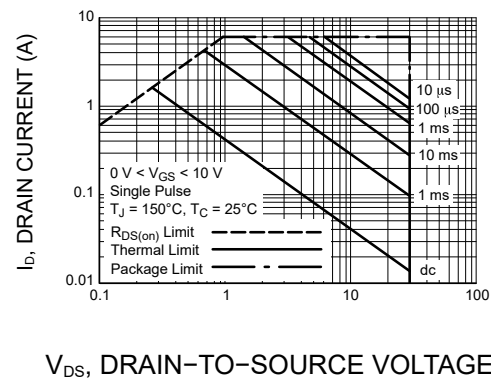


Figure 9: Maximum Rated Forward Biased Safe Operating Area

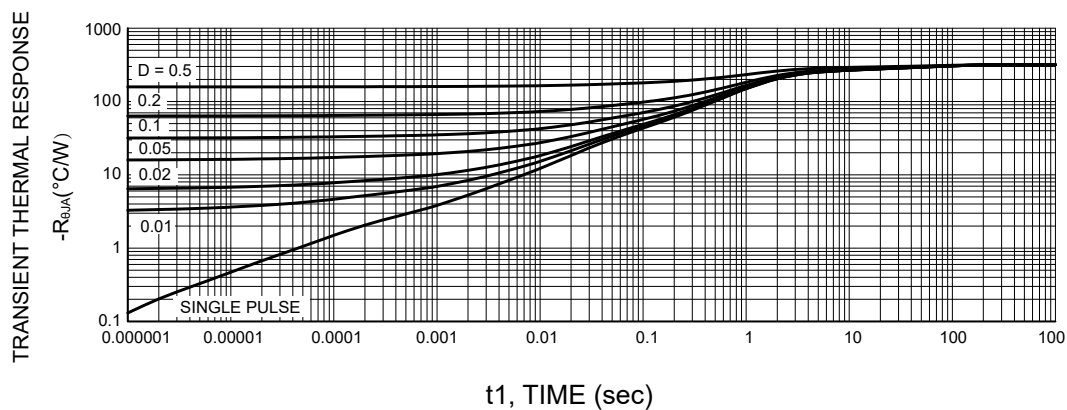
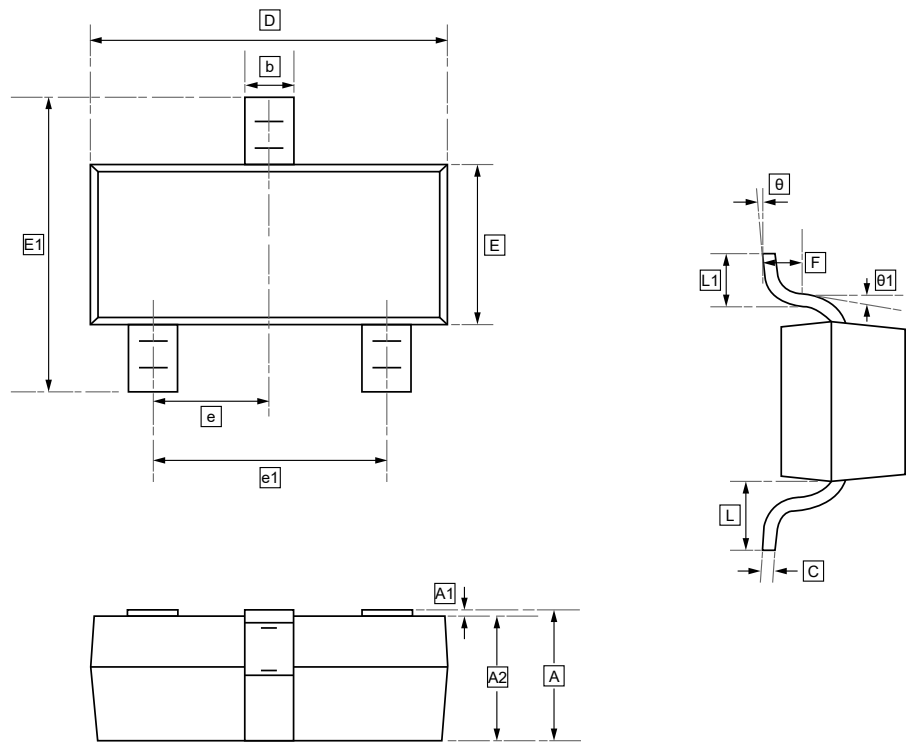


Figure 10. Thermal Response



8.SOT-23 Package Outline Dimensions



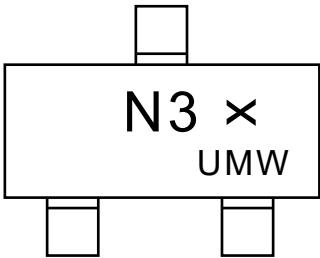
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°



9.Ordering information



x: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW MGSF1N03L	SOT-23	3000	Tape and reel



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