

1. Description

These devices are well suited for low voltage and battery powered applications where low in-line power loss is needed in a very small outline surface mount package.

3. Application

- Notebook computer power management

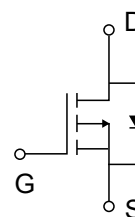
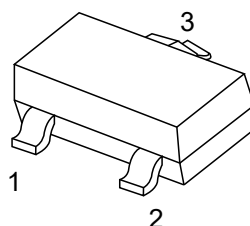
2. Features

- $V_{DS(V)} = -30V$
- $I_D = -1.3A$
- $R_{DS(ON)}(V_{GS} = -10V) \leq 150m\Omega$
- $R_{DS(ON)}(V_{GS} = -4.5V) \leq 250m\Omega$

4. Pinning information

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

SOT-23



5. Maximum ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-30	V
Gate-Source Voltage	V_{GSS}	± 25	V
Drain Current – Continuous (Note 1a) – Pulsed	I_D	-1.3	A
		-10	
Maximum Power Dissipation (Note 1a) (Note 1b)	P_D	0.5	W
		0.46	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Characteristics			
Thermal Resistance, Junction-to-Ambient (Note 1a)	$R_{\theta JA}$	250	$^\circ C/W$
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	75	$^\circ C/W$



6. $T_A=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-30			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =-250μA Referenced to 25°C		-17		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	μA
Gate–Body Leakage	I _{GSS}	V _{GS} =±25V, V _{DS} =0V			±100	nA
On Characteristics (Note 2)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.8	-2	-2.5	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I _D =-250μA Referenced to 25°C		4		mV/°C
Static Drain–Source On–Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-1.3A		120	150	mΩ
		V _{GS} =-4.5V, I _D =-1.1A		150	250	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-0.9A		2		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V,f =1MHz		150		pF
Output Capacitance	C _{oss}			40		pF
Reverse Transfer Capacitance	C _{rss}			20		pF
SWITCHING PARAMETERS (Note 2)						
Turn-On DelayTime	t _{D(on)}	V _{DD} =-10V, I _D =-1A V _{GS} =-10V, R _{GEN} =6Ω		4	8	ns
Turn-On Rise Time	t _r			15	28	ns
Turn-Off DelayTime	t _{D(off)}			10	18	ns
Turn-Off Fall Time	t _f			1	2	ns
Total Gate Charge	Q _g	V _{DS} =-10V, I _D =-0.9A V _{GS} =-4.5V		1.4	1.9	nC
Gate–Source Charge	Q _{gs}			0.5		nC
Gate–Drain Charge	Q _{gd}			0.5		nC



Drain–Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain–Source Diode Forward Current	I_S				-0.42	A
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-0.42A$ (Note 2)		-0.8	-1.2	V
Diode Reverse Recovery Time	t_{rr}	$I_F=-3.9A$ $dI_F/dt=100A/\mu s$		17		ns
Diode Reverse Recovery Charge	Q_{rr}			7		nC

1. $R_{\theta JA}$ 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. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.
- (a) $R_{\theta JA} = 250^{\circ}C/W$ when mounted on a 0.02 in^2 pad of 2oz. copper.
- (b) $R_{\theta JA} = 270^{\circ}C/W$ when mounted on a 0.001 in^2 pad of 2oz. copper.
2. Pulse Test: Pulse Width < $300\mu s$, Duty Cycle < 2.0%



7.1 Typical Characteristics

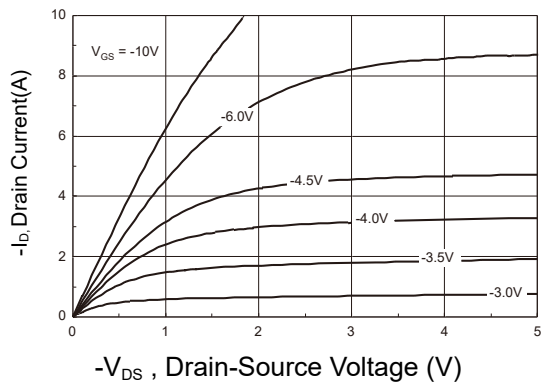


Figure 1: On-Region Characteristics.

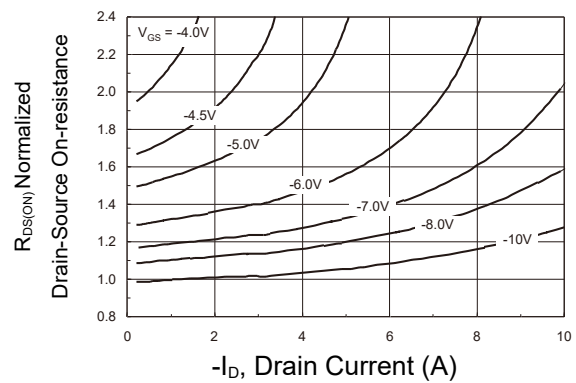


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

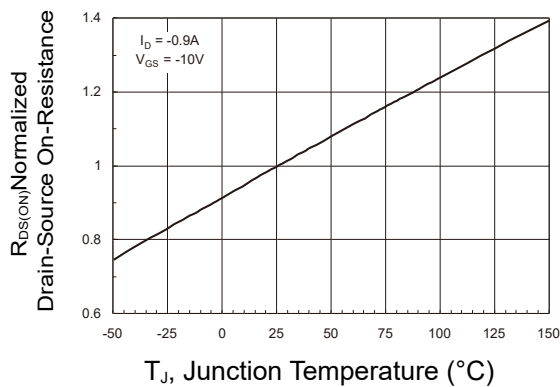


Figure 3: On-Resistance Variation with Temperature.

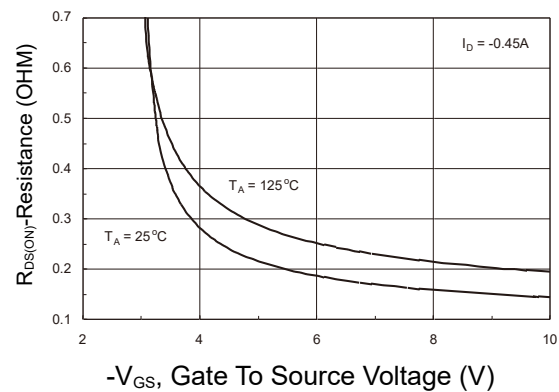


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

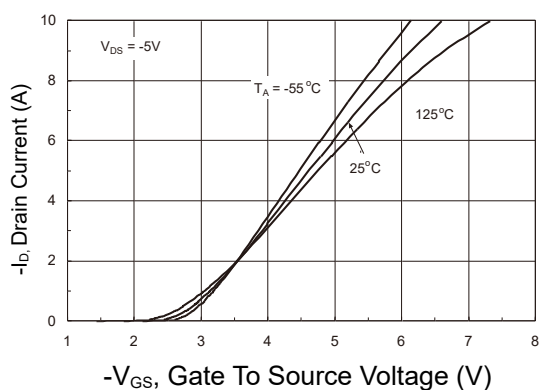


Figure 5: Transfer Characteristics.

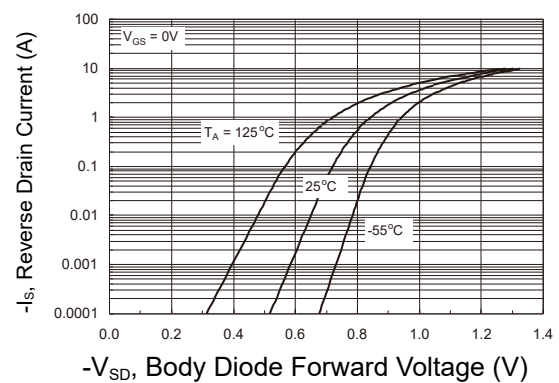


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.



7.2 Typical Characteristics

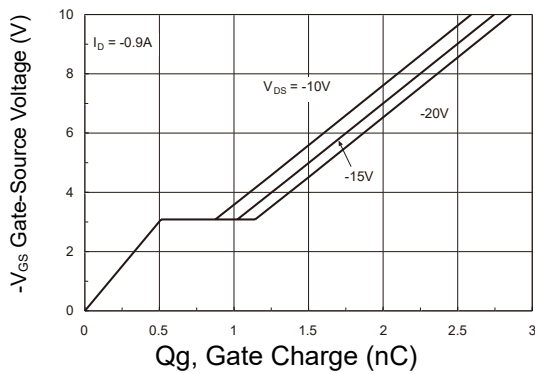


Figure 7: Gate-Charge Characteristics

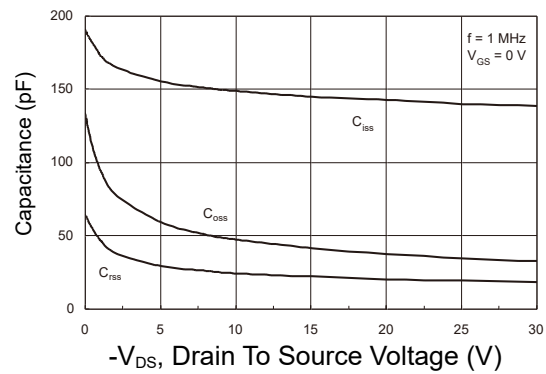


Figure 8: Capacitance Characteristics

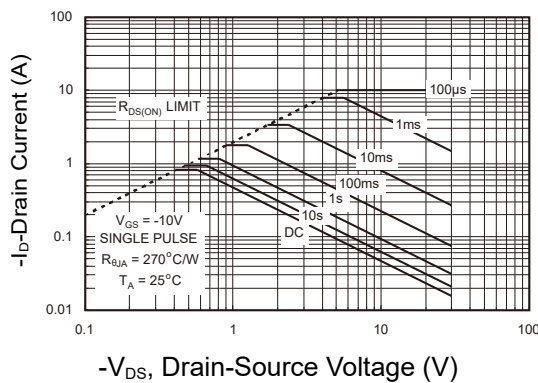


Figure 9: Maximum Safe Operating Area.

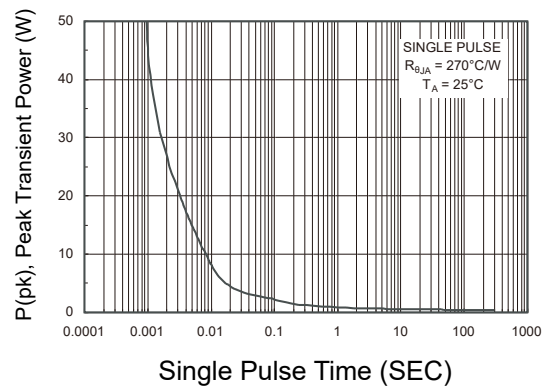


Figure 10: Single Pulse Maximum Power Dissipation.

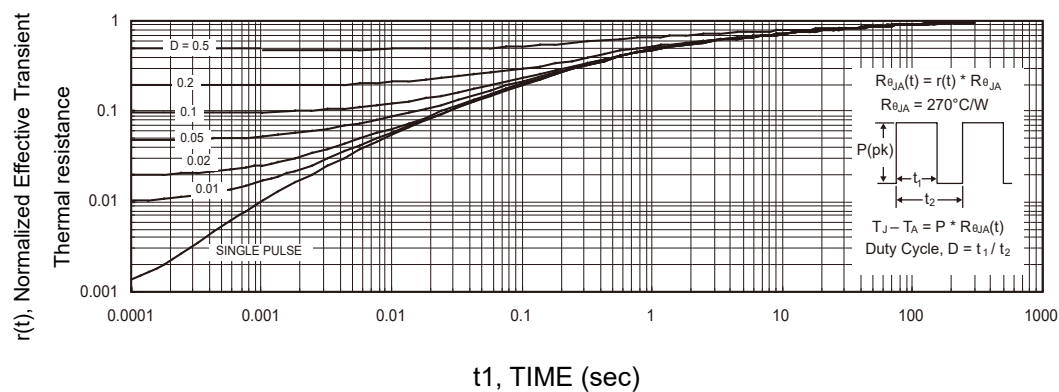
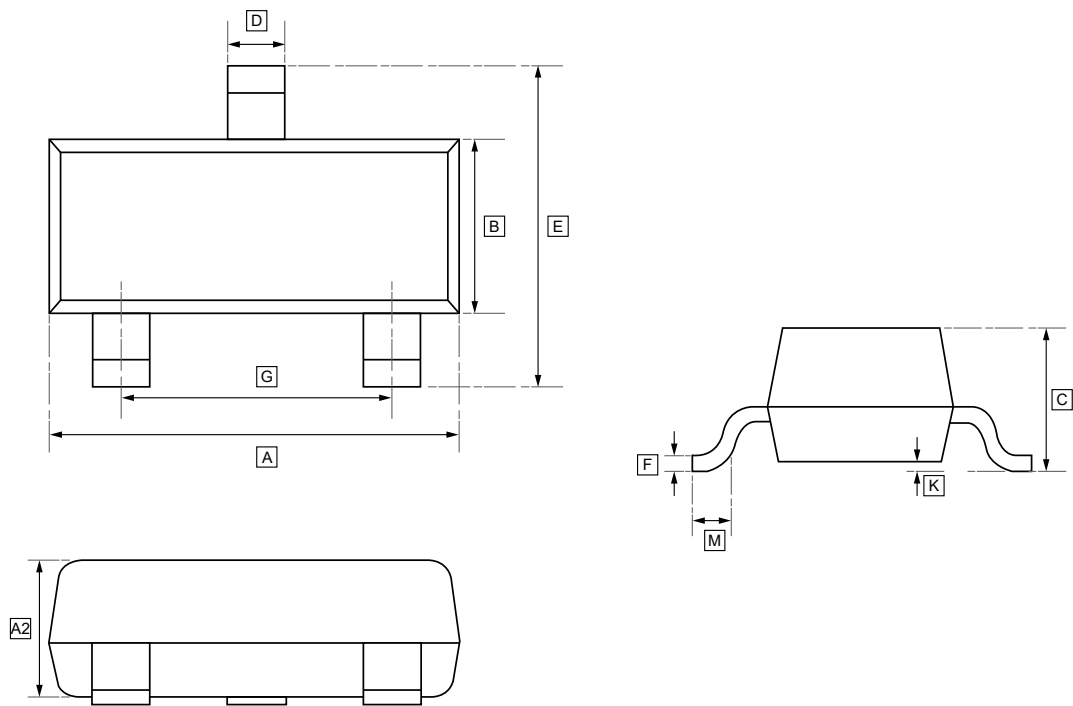


Figure 11. Transient Thermal Response Curve.



8.SOT-23 Package Outline Dimensions

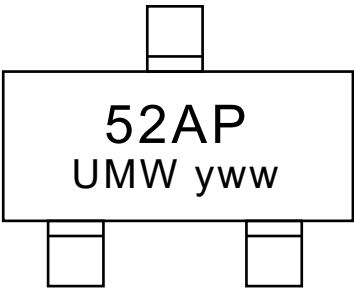


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
Min	2.85	1.20	0.90	0.40	2.25	1.80	0.00	0.30	0.95	0.095
Max	3.04	1.40	1.10	0.50	2.55	2.00	0.10	-	1.05	0.115



9.Ordering Information



Order Code	Package	Base QTY	Delivery Mode
UMW FDN352AP	SOT-23	3000	Tape and reel



10.Disclaimer

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