

1. Description

The UMW BS170FTA uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltage as low as 2.5V. This device is suitable for use as a load switch or in PWM application.

2.2 Features

- Halogen-free According to IEC 61249-2-21 Definition
- Low Threshold: 2 V (typ.)
- Low Input Capacitance: 25 pF
- Fast Switching Speed: 25 ns

2.1 Features

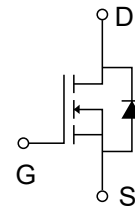
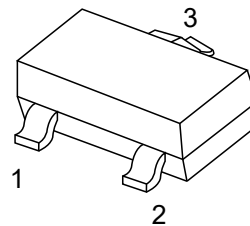
- $V_{DS(V)} = 60V$
- $I_D = 250mA$
- $R_{DS(ON)} < 2.8m\Omega (V_{GS} = 10V)$

- Low Input and Output Leakage
- TrenchFET® Power MOSFET
- 1200V ESD Protection
- Compliant to RoHS Directive 2002/95/EC

4. Pinning information

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

SOT-23



5. Absolute Maximum Ratings $T_A = 25^\circ C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ C$) ^b	$T_A = 25^\circ C$	I_D	250	mA
	$T_A = 100^\circ C$		150	
Pulsed Drain Current ^a		I_{DM}	800	
Power Dissipation ^b	$T_A = 25^\circ C$	P_D	0.3	W
	$T_A = 100^\circ C$		0.13	



Maximum Junction-to-Ambient ^b	R_{thJA}		°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

Notes:

- a. Pulse width limited by maximum junction temperature.
- b. Surface Mounted on FR4 board.



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	$I_D=10\mu\text{A}, V_{GS}=0\text{V}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1		2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 10	μA
		$V_{DS}=0\text{V}, V_{GS}=\pm 15\text{V}$			1	
		$V_{DS}=0\text{V}, V_{GS}=\pm 10\text{V}$			± 150	nA
		$V_{DS}=0\text{V}, V_{GS}=\pm 10\text{V}, T_J=85^\circ\text{C}$			± 1000	
		$V_{DS}=0\text{V}, V_{GS}=\pm 5\text{V}$			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$			1	μA
		$V_{DS}=60\text{V}, V_{GS}=0\text{V}, T_J=125^\circ\text{C}$			500	
On-State Drain Current ^a	$I_{D(ON)}$	$V_{GS}=10\text{V}, V_{DS}=7.5\text{V}$	500			mA
		$V_{GS}=4.5\text{V}, V_{DS}=10\text{V}$	300			
Drain-Source On-Resistance ^a	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=200\text{mA}$		2800	3300	m Ω
		$V_{GS}=4.5\text{V}, I_D=150\text{mA}$		3100	3800	
Forward Transconductance ^a	g_{FS}	$V_{DS}=10\text{V}, I_D=100\text{mA}$	100			mS
Diode Forward Voltage	V_{SD}	$I_S=100\text{mA}, V_{GS}=0\text{V}$			1.3	V
Dynamic ^a						
Total Gate Charge	Q_g	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V}$ $I_D \cong 150\text{mA}$		0.4	0.6	nC
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		25		pF
Output Capacitance	C_{oss}			5		
Reverse Transfer Capacitance	C_{rss}			2		
Switching ^{a, b, c}						
Turn-On Time	$t_{D(on)}$	$V_{DD}=30\text{V}, R_L=150\Omega$			20	ns
Turn-Off Time	$t_{D(off)}$	$I_D \cong 150\text{mA}, V_{GEN}=10\text{V}, R_G=10\Omega$			30	

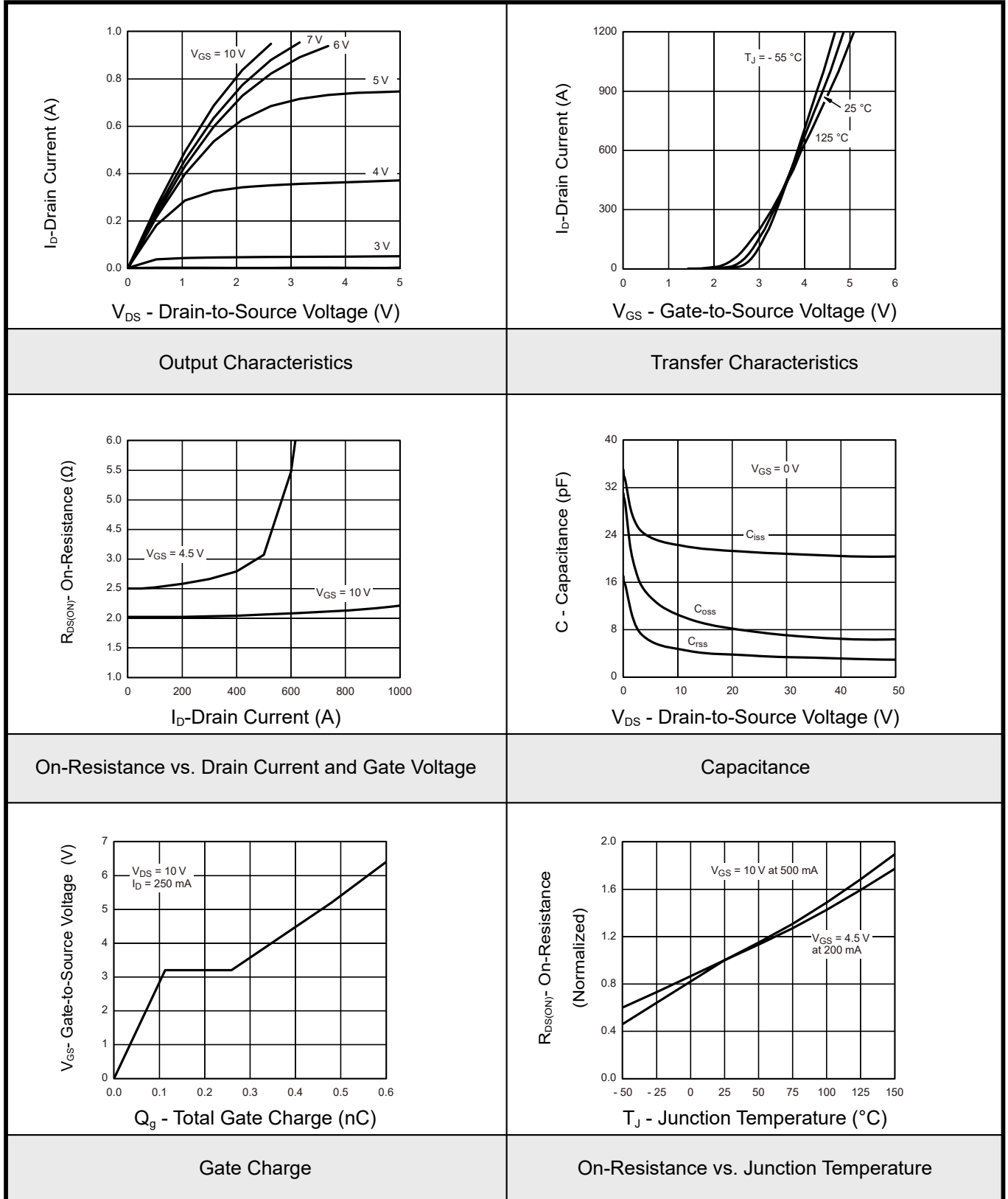
a. For DESIGN AID ONLY, not subject to production testing.

b. Pulse test: $PW \leq 300 \mu\text{s}$ duty cycle $\leq 2\%$.

c. Switching time is essentially independent of operating temperature.

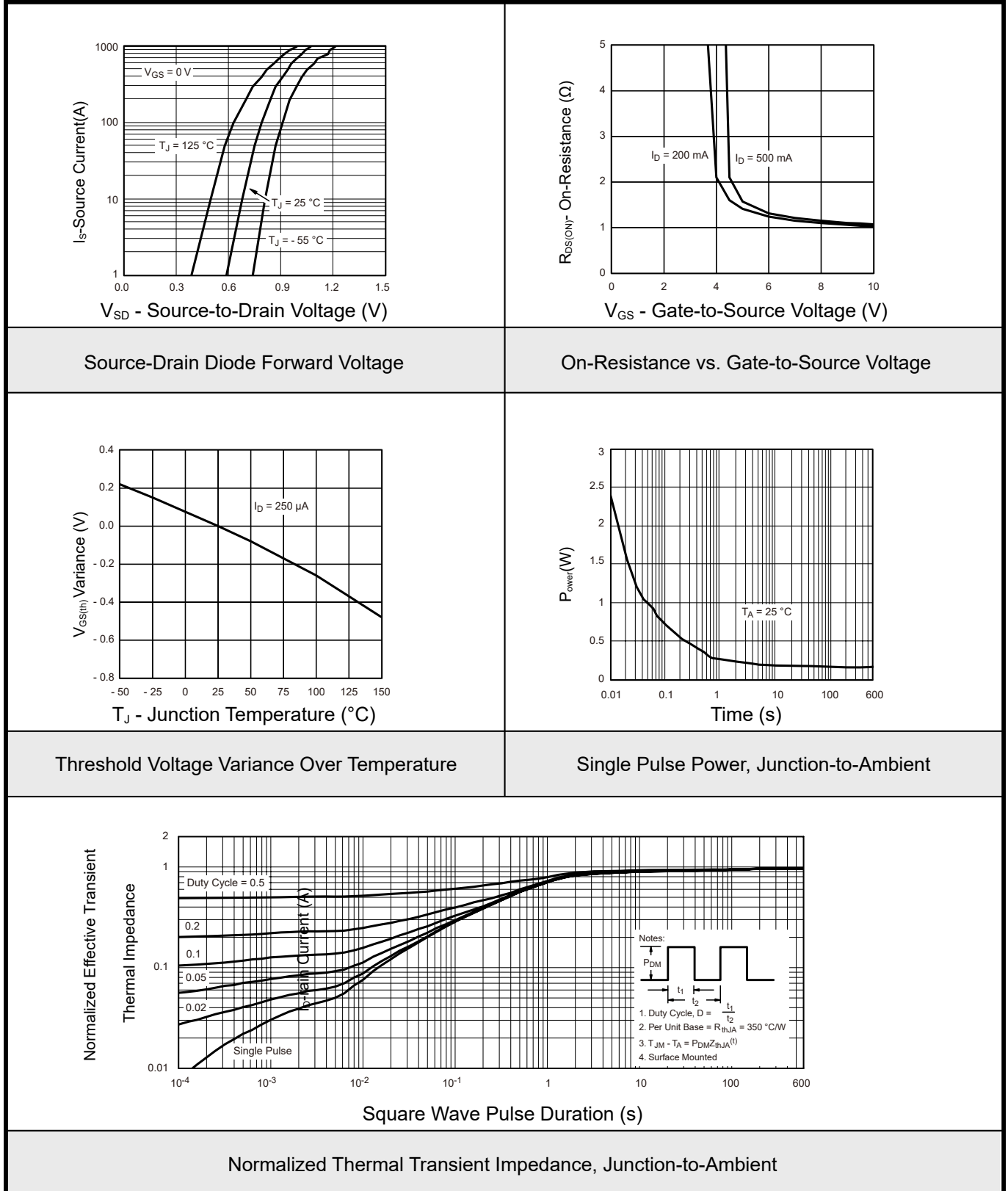


7.1 Typical Characteristics



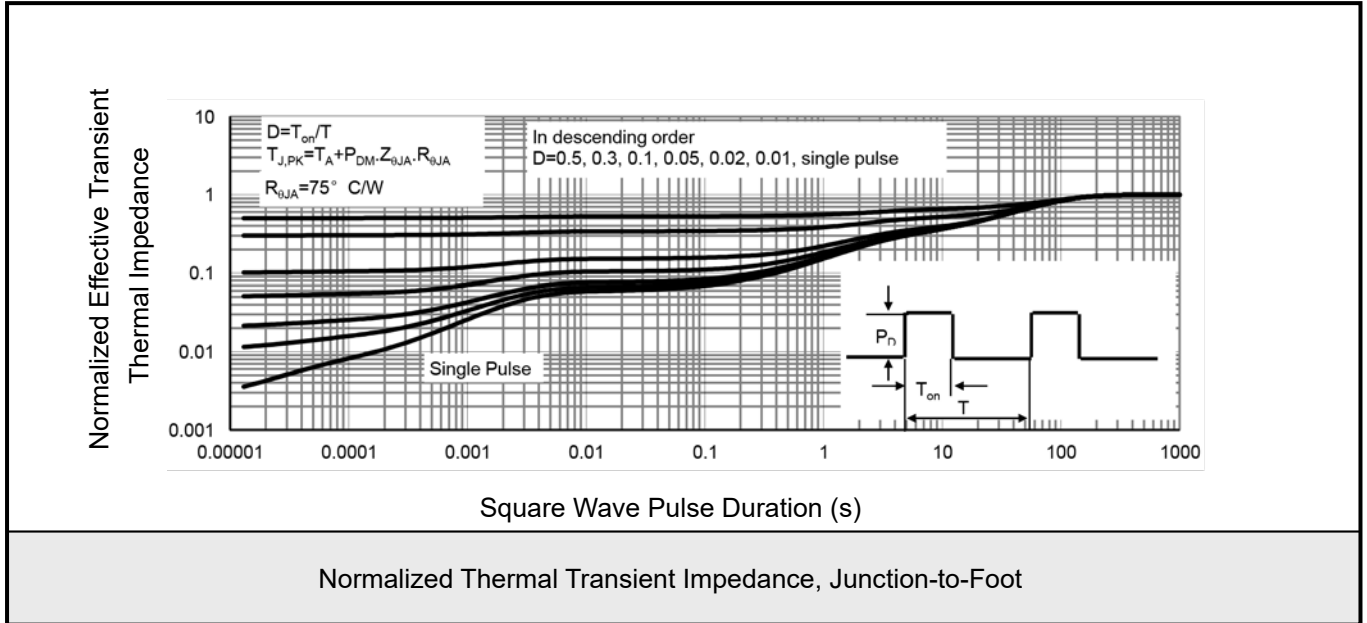


7.2 Typical Characteristics





7.3 Typical characteristic



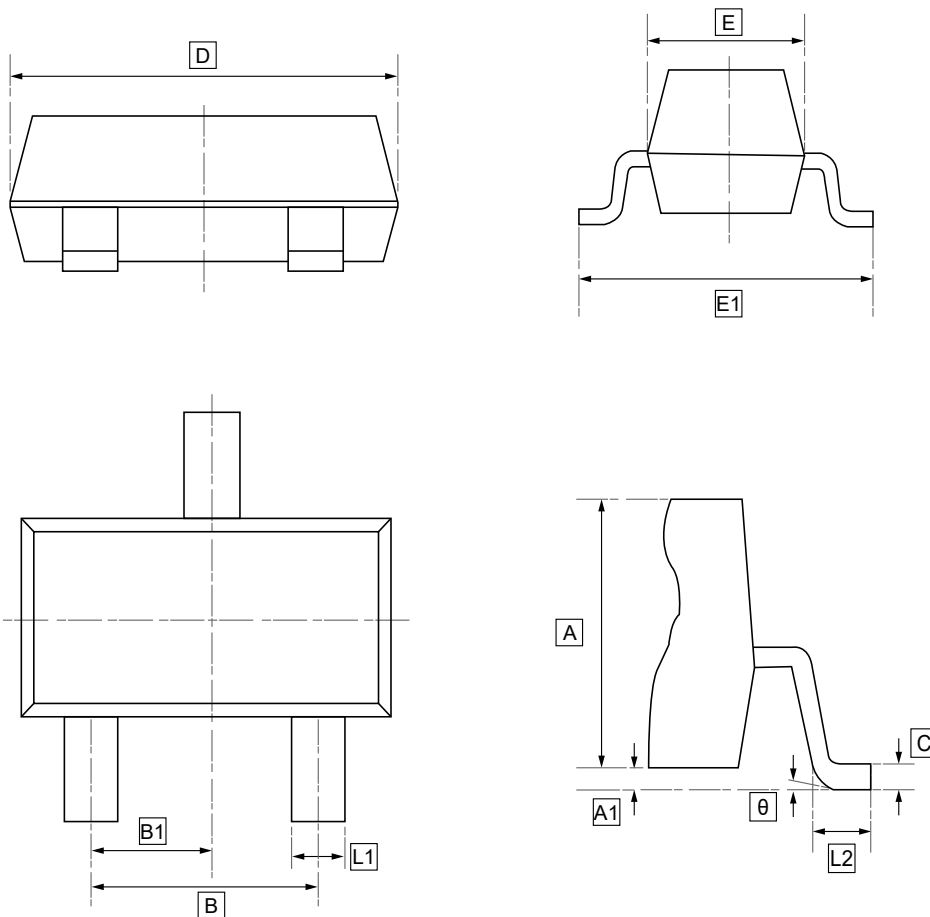
The characteristics shown in the two graphs

- Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
- Normalized Transient Thermal Impedance Junction-to-Foot (25 °C)

are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.



8.SOT-23 Package Outline Dimensions

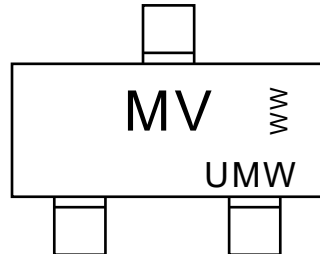


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	L1	L2	C	D	E	E1	B	B1	θ
Min	1.050	0.000	0.300	0.350	0.100	2.820	1.500	2.700	1.800	0.950	0°
Max	1.150	0.100	0.500	0.550	0.200	3.020	1.700	2.900	2.000	TYP	8°



9. Ordering information



WW: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW BS170FTA	SOT-23	3000	Tape and reel



10.Disclaimer

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