UMW BSS308PE

-30V P-Channel MOSFET

1.Description

The BSS308PE uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V.This device is suitable for use as a load switch applications.

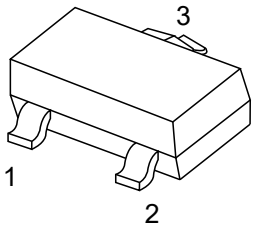
2.Features

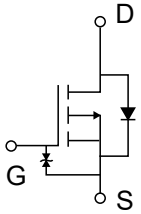
- $V_{DS\ (V)}$=-30V
- $R_{DS(ON)}$＜70mΩ(V_{GS}=10V)
- $R_{DS(ON)}$＜90mΩ(V_{GS}=4.5V)

3.Pinning information

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

SOT-23





4.Maximum ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Value	Units
Drain-Source Voltage	I_D	T_A=25 °C	-2	A
		T_A=70 °C	-1.6	
Pulsed drain current	$I_{D,\ pulse}$	T_A=25 °C	-8	
Avalanche energy, single pulse	E_{AS}	I_D=-2 A, R_{GS}=25 Ω	-10.7	mJ
Reverse diode dv/dt	dv /dt	I_D=-2 A, V_{DS}=-16V di/dt =-200A/μs,$T_{j,max}$=150 °C	6	kV/μs
Gate source voltage	V_{GS}		±20	V
Power dissipation[1)]	P_{tot}	T_A=25 °C	0.5	W
Operating and storage temperature	T_J, T_{STG}		-55 to 150	°C
ESD Class		JESD22-A114 -HBM	2 (2kV to 4kV)	
Soldering Temperature			260°C	°C
IEC climatic category; DIN IEC 68-1			55/150/56	°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Thermal characteristics						
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint [1)]		250	250	K/W
Electrical characteristics, at T j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-30			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-11μA	-1	-1.5	-2	
Drain-source leakage current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V,T_J=25°C			-1	μA
		V_{DS}=-30V,V_{GS}=0V,T_J=125°C			-100	
Gate-source leakage current	I_{GSS}	V_{GS}=-20V, V_{DS}=0V			-5	μA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-1.7A		70	90	mΩ
		V_{GS}=-10V, I_D=-2A		62	70	
Transconductance	g_{FS}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-1.6 A		4.6		S

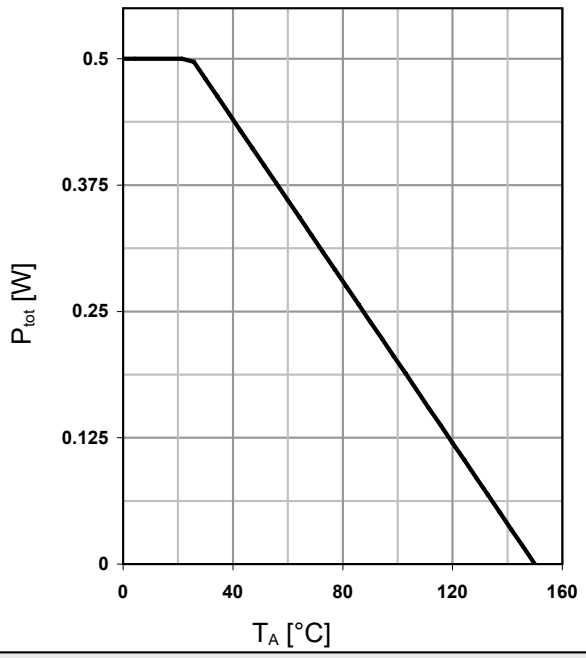
1) Performed on 40mm^2

FR4 PCB. The traces are 1mm wide, 70μm thick and 20mm long; they are present on both sides of the PCB.

5.Electrical Characteristics T_A=25°C

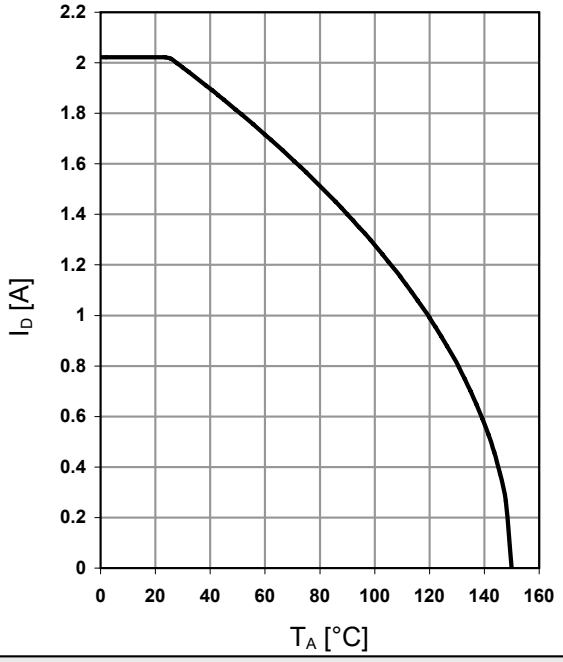
Parameter		Symbol	Conditions	Min	Typ	Max	Units
Dynamic characteristics							
Input capacitance	BV_{DSS}	C_{iss}	V_{DS}=0V, V_{GS}=-15V, f=1MHz		376	500	pF
Output capacitance		C_{oss}			196	261	
Reverse transfer capacitance		C_{rss}			12	18	
Turn-on delay time	I_{GSS}	$t_{D(on)}$	V_{DD}=-15V, V_{GS}=-10V R_G=6Ω, I_D=-2A		5.6		ns
Rise time	$V_{GS(th)}$	t_r			7.7		
Turn-off delay time	$I_{D(ON)}$	$t_{D(off)}$			15.3		
Fall time		t_f			2.8		
Gate Charge Characteristics							
Gate to source charge	g_{FS}	Q_{gs}	V_{DD}=-15V, I_D=-2A V_{GS}=0 to -10V		-1.2		nC
Gate to drain charge	V_{SD}	Q_{gd}			-0.6		
Gate charge total	I_S	Q_g			-5		
Gate plateau voltage		$V_{plateau}$			-3.1		V
Reverse Diode	C_{iss}						
Diode continous forward current	C_{oss}	I_S	T_A=85°C			-0.4	V
Diode pulse current	C_{rss}	$I_{S,pulse}$				-8.4	
Diode forward voltage	R_g	V_{SD}	V_{GS}=0V, I_F=-2V, T_J=25°C		0.8	-1.1	V
Reverse recovery time		t_{rr}	V_R=10V, I_F=-2A di_F/dt =100A/μs		14		nS
Reverse recovery charge		Q_{rr}			-5.9		nC

6.1 Typical Characterisitics



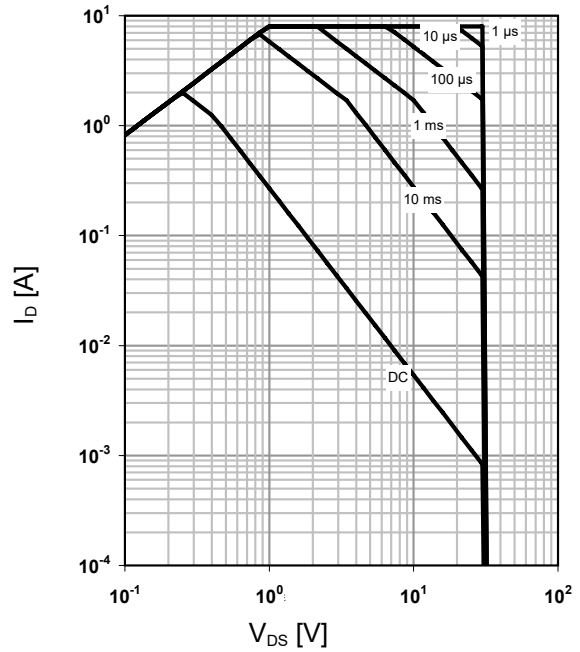
1 Power dissipation

$P_{tot}=f(T_A)$



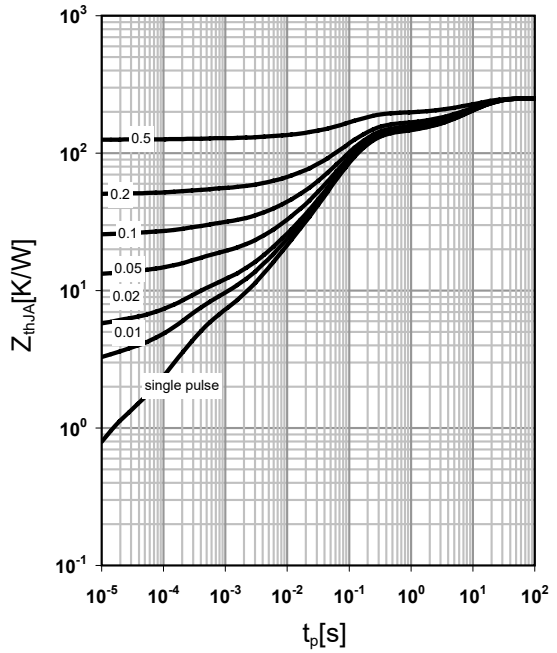
2 Drain current

$I_D=f(T_A)$; $V_{GS}\geq 10V$



3 Safe operating area

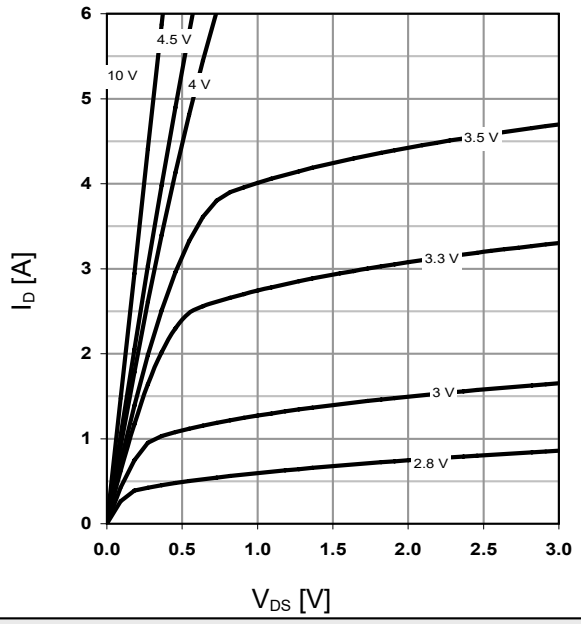
$I_D=f(V_{DS})$; TA=25°C; D=0, parameter: t_p



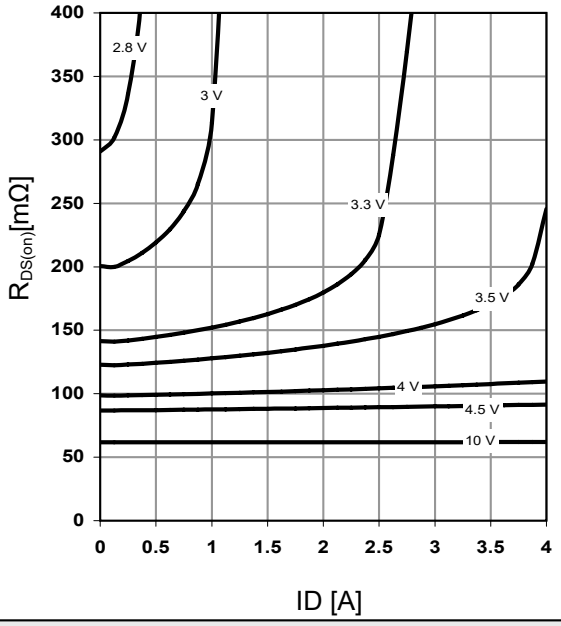
4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$, parameter: $D=t_p/T$

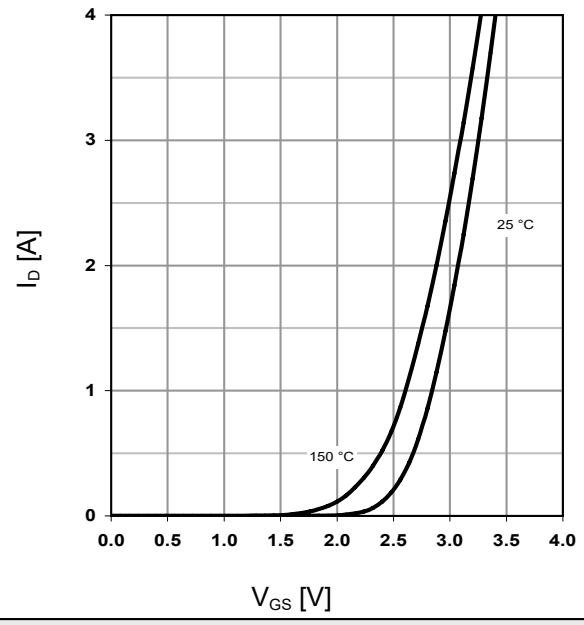
6.2 Typical Characterisitics



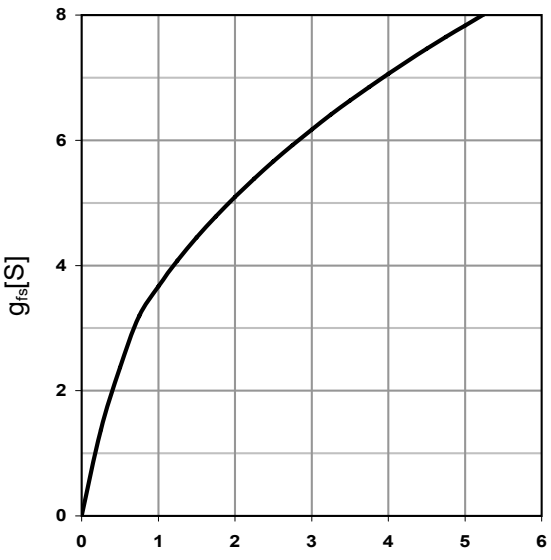
5 Typ. output characteristics
$I_D=f(V_{DS})$; $T_J=25°C$, parameter: V_{GS}



6 Typ. drain-source on resistance
$R_{DS(on)}=f(I_D)$; $T_J=25°C$, parameter: V_{GS}

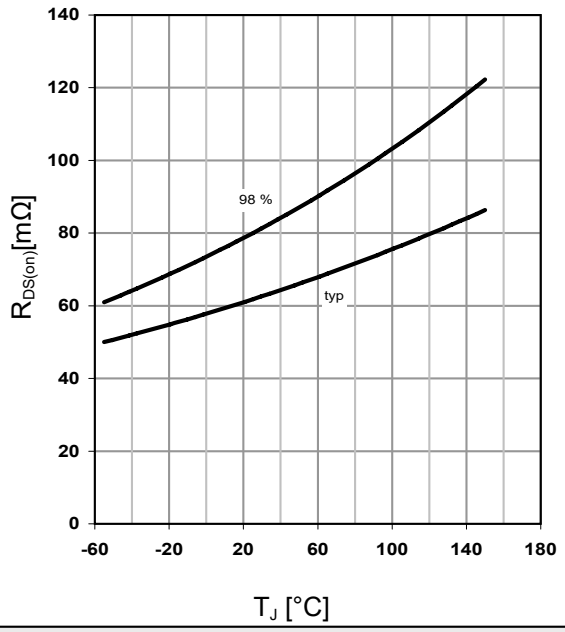


7 Typ. transfer characteristics
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)}max$

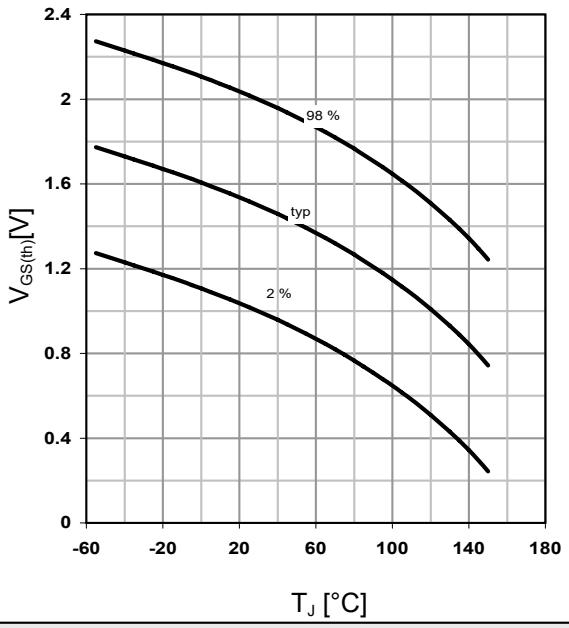


8 Typ. forward transconductance
$g_{fs}=f(_{ID})$; $T_J=25°C$

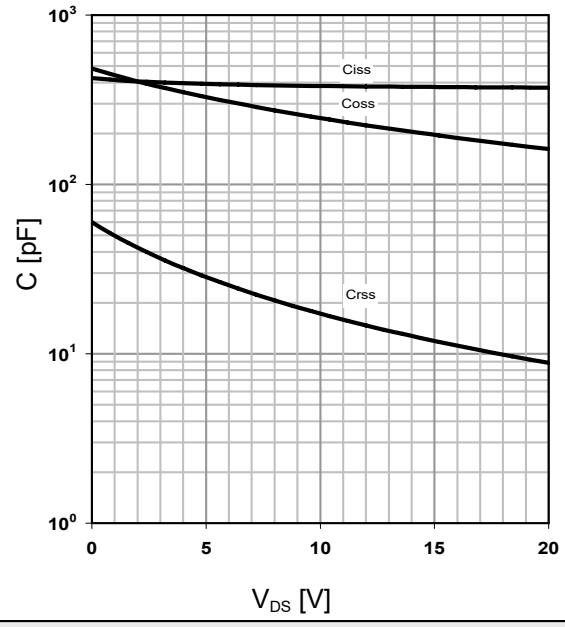
6.3 Typical Characterisitics



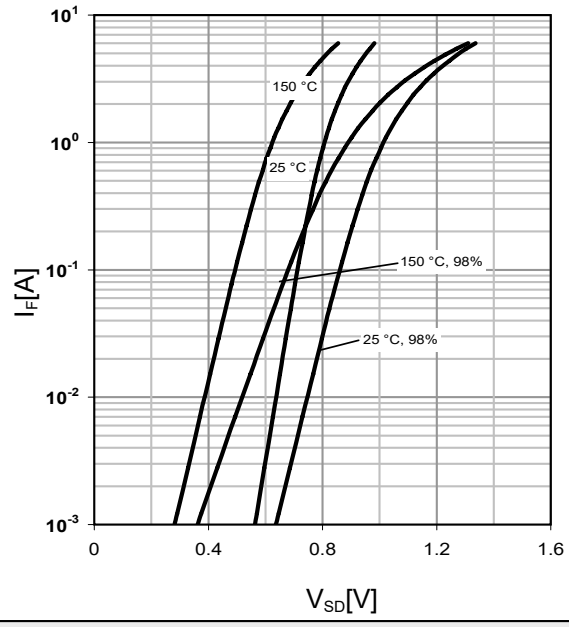
9 Drain-source on-state resistance
$R_{DS(on)}=f(T_J)$; I_D=-2A; V_{GS}=-10V



10 Typ. gate threshold voltage
$V_{GS(th)}=f(T_J)$, $V_{DS}=V_{GS}$, I_D=11µA, parameter: I_D

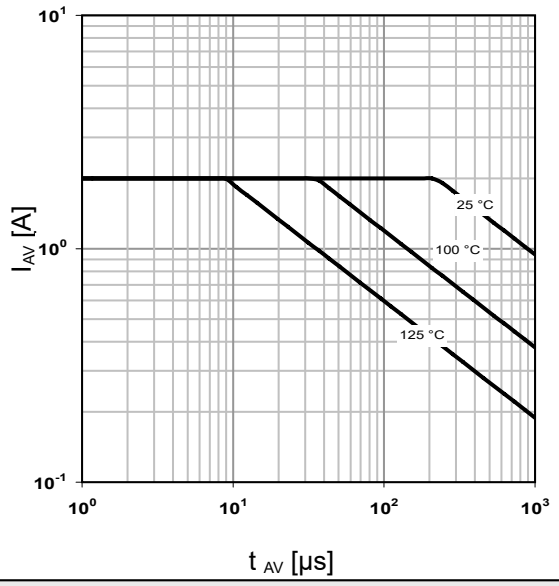


11 Typ. capacitances
$C=f(V_{DS})$; V_{GS}=0V; f =1MHz; T_J=25°C



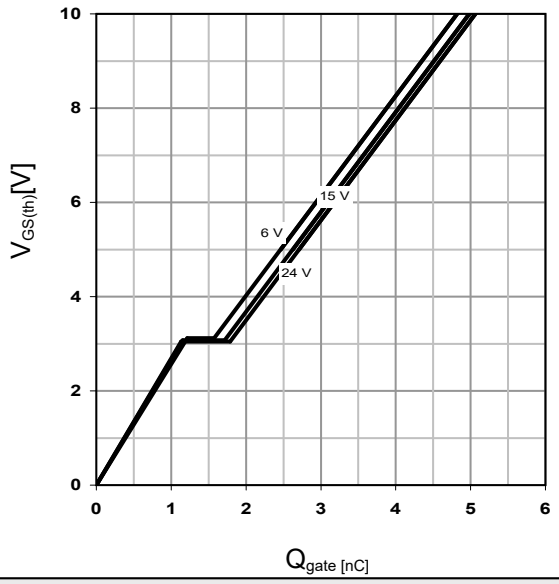
12 Forward characteristics of reverse diode
$I_F=f(V_{SD})$parameter: T_J

6.4 Typical Characterisitics



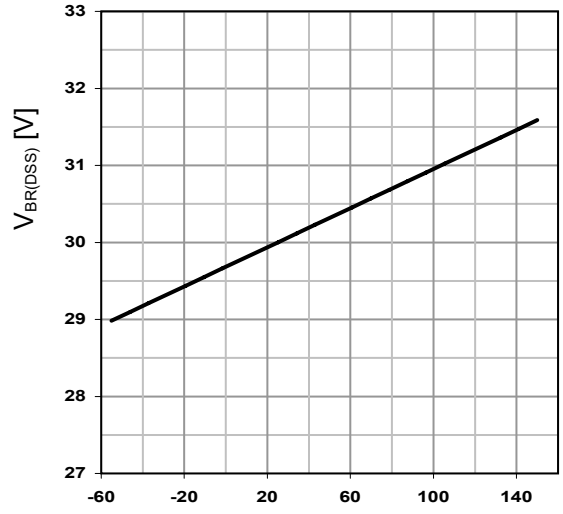
13 Avalanche characteristics

$I_{AS}=f(t_{AV})$; R_{GS}=25Ω; parameter: $T_{j(start)}$



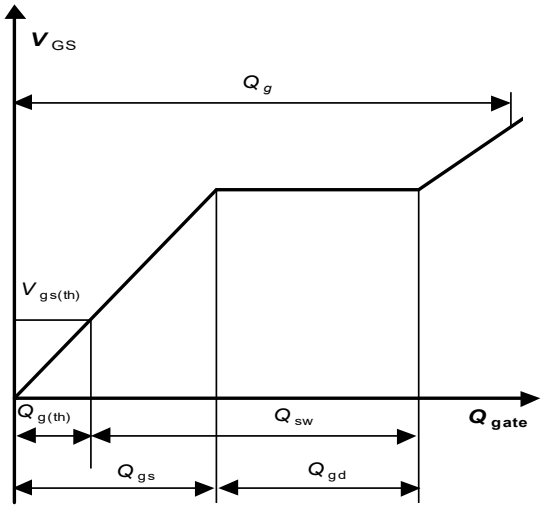
14 Typ. gate charge

$V_{GS}=f(Qgate)$; I_D=-2 A pulsed; parameter: V_{DD}



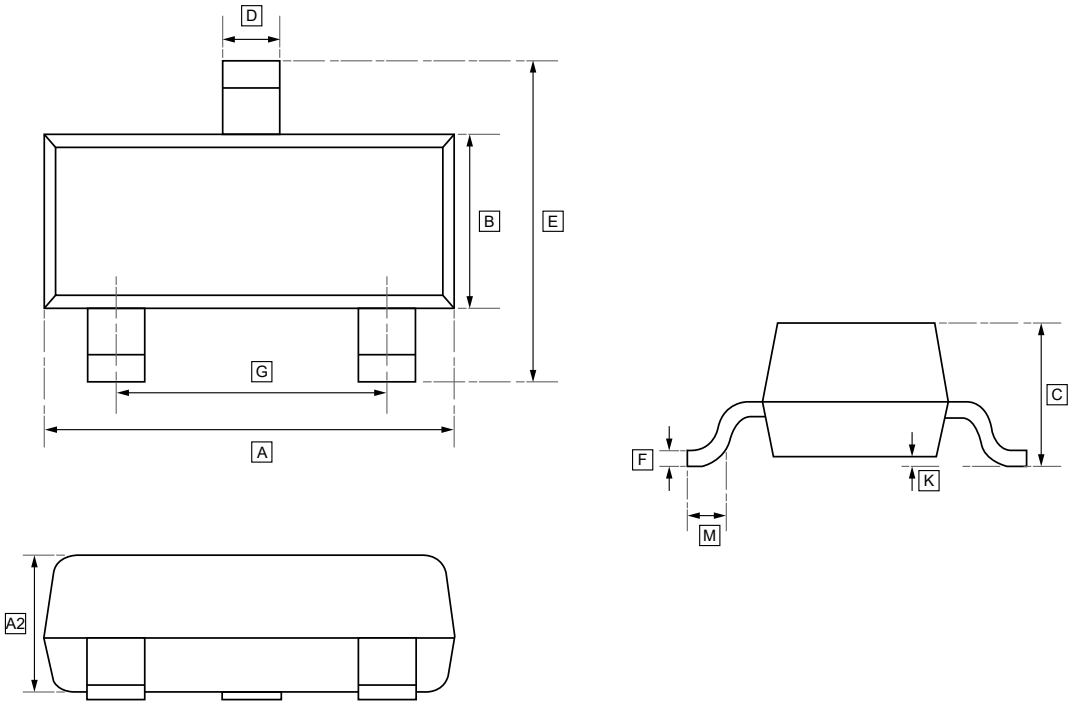
15 Drain-source breakdown voltage

$V_{BR(DSS)}=f(T_j)$; I_D=250 µA



16 Gate charge waveforms

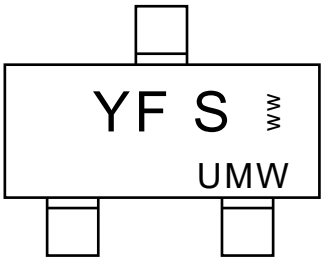
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
Min	2.80	1.20	0.90	0.32	2.25	1.80	0.00	0.30	0.95	0.095
Max	3.04	1.40	1.10	0.55	2.55	2.00	0.10	-	1.05	0.115

8.Ordering Information



ww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW BSS308PE	SOT-23	3000	Tape and reel

9.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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