UMW BSP318S

60V N-Channel MOSFET

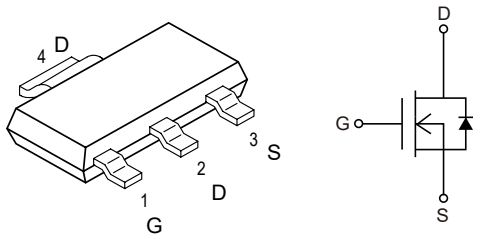
1.Features

- $V_{DS(V)}$=60V
- I_D=2.6A(V_{GS}=10V)
- $R_{DS(ON)}$ <0.12Ω(V_{GS}=10V)
- $R_{DS(ON)}$ <0.07Ω(V_{GS}=4.5V)
- N-Channel
- Enhancement mode
- Avalanche rated
- Logic Level
- dv/dt rated
- Pb-free lead plating; RoHS compliant

2.Pinning information

Pin	Symbol	Description
1	G	GATE
2,4	D	DRAIN
3	S	SOURCE

SOT-223 top view



3.Absolute Maximum Ratings T_J=25°C unless otherwise noted

Parameter	Symbol	Conditions	Value	Units
Continuous drain current	I_D		2.6	A
Pulsed drain current	$I_{D,pulse}$	T_A=25°C	10.4	A
Avalanche energy, single pulse	E_{AS}	I_D=2.6A,V_{DD}=25V,R_{GS}=25Ω	60	mJ
Avalanche energy, periodic limited byT_{jmax}	I_{AR}		2.6	A
Avalanche energy, periodic limited byT_{jmax}	E_{AR}		0.18	mJ
Reverse diode dv /dt	dv/dt	I_S=2.6A, V_{DS}=20V, di/dt=200A/μs, T_{jmax}=150°C	6	kV/μs
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_A=25°C	1.8	W
Operating and storage temperature	T_J,T_{STG}		-55 to 150	°C
IEC climatic category; DIN IEC 68-1			55/150/56	
ESD Class; JESD22-A114-HBM			Class 1b	

4.Thermal Resistance Rating

Parameter	Symbol	min.	typ.	max.	Units
Thermal resistance, junction - soldering point (Pin 4)	R_{thJS}		17		K/W
SMD version, device on PCB: @ min. footprint	R_{thJA}		100		K/W
@ 6 cm^2 cooling area [1)]				70	K/W

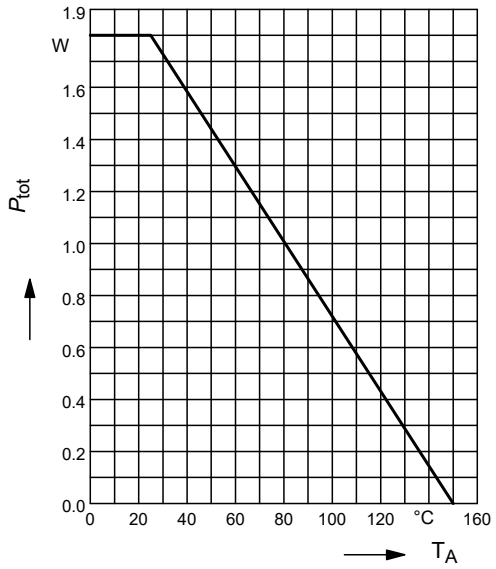
5.Specifications (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=0.25mA	60			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=20μA	1.2	1.6	2	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V, V_{GS}=0V, T_J=25°C		0.1	1	μA
		V_{DS}=60V, V_{GS}=0V, T_J=150°C			100	μA
Gate-source leakage current	I_{GSS}	V_{GS}=20V, V_{DS}=0V		10	100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=2.6A		0.12	0.15	Ω
		V_{GS}=10V, I_D=2.6A		0.07	0.09	Ω
Dynamic characteristics						
Transconductance	g_{FS}	V_{DS}≥2*I_D*$R_{DS(ON)max}$, I_D=2.6A	2.4	5.5		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f =1MHz		300	380	pF
Output Capacitanc	C_{oss}			90	120	pF
Reverse Transfer Capacitance	C_{rss}			50	65	pF
Turn-On DelayTime	$t_{D(on)}$	V_{DD}=30V, V_{GS}=4.5V I_D=2.6A, R_G=16Ω		12	20	ns
Rise Time	t_r			15	25	ns
Turn-Off DelayTime	$t_{D(off)}$			20	30	ns
Fall Time	t_f			15	25	ns
Gate Charge Characteristics						
Gate charge at threshold	$Q_{g(th)}$	V_{DD}=40V,I_D=0.1A,V=1V		0.4	0.6	nC
Gate charge at	$Q_{g(5)}$	V_{DD}=40V,I_D=2.6A,V_{GS}=0 to 5V		7	10	nC
Gate charge total	Q_g	V_{DD}=40V,I_D=2.6A,V_{GS}=0 to 10V		14	20	nC
Gate plateau voltage	$V_{plateau}$	V_{DD}=40V,I_D=2.6A		3.6		V

Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C			2.6	A
Inverse diode direct current,pulsed	I_{SM}				10.4	A
Inverse diode forward voltage	V_{SD}	V_{GS}=0 V, IF=5.2A		0.95	1.2	V
Reverse recovery time	t_{rr}	V_R=30V, I_F=I_S,		50	75	ns
Reverse recovery charge	Q_{rr}	di_F/dt =100A/μs		0.1	0.15	μC

6.1Typical characteristic

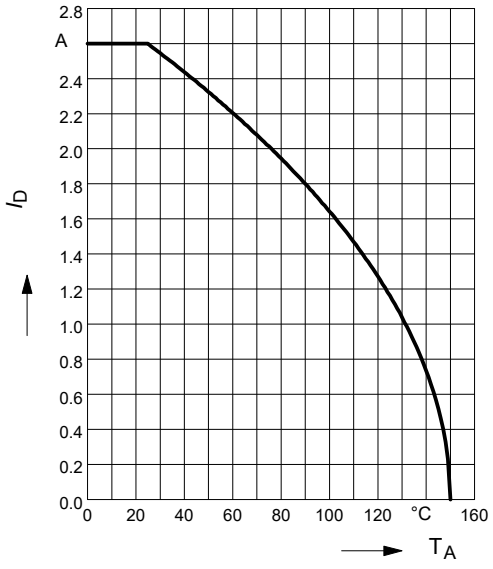
$P_{tot}=f(T_A)$



T_A (°C)

Figure 1: Power dissipation

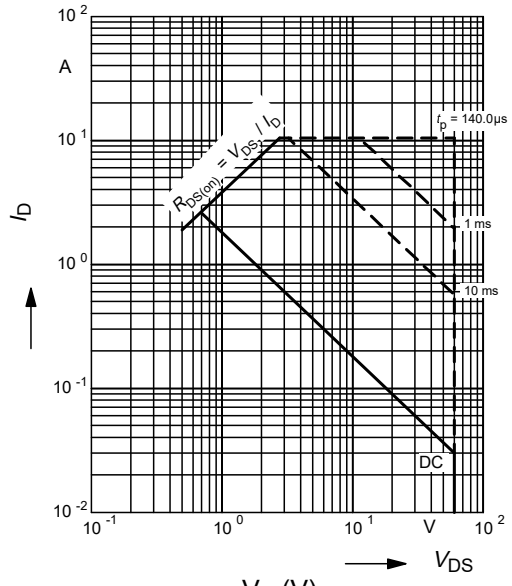
$I_D=f(T_A)$



T_A (°C)

Figure 2: Drain current

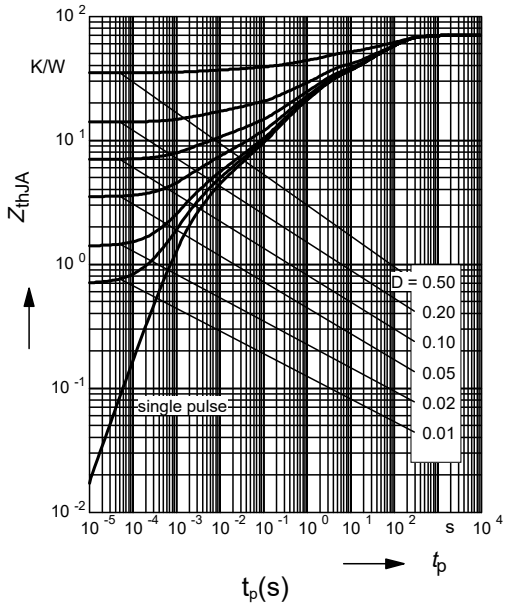
$I_D=f(V_{DS})$; parameter:T_A=25°C; D=0



V_{DS}(V)

Figure 3: Safe Operating Area

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

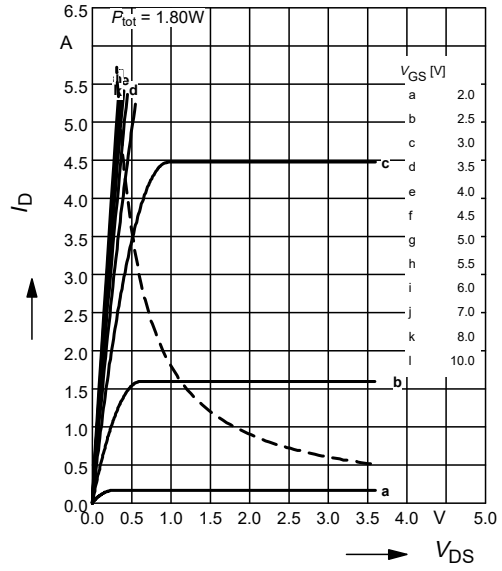


t_p(s)

Figure 4:Max. Transient Thermal Impedance

6.2Typical characteristic

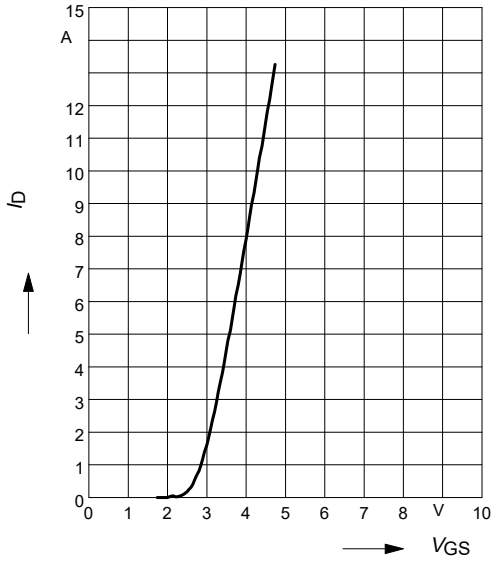
I_D=f(V_{DS}); parameter: T_p=80μs



V_{DS}(V)

Figure 5: Output Characteristics

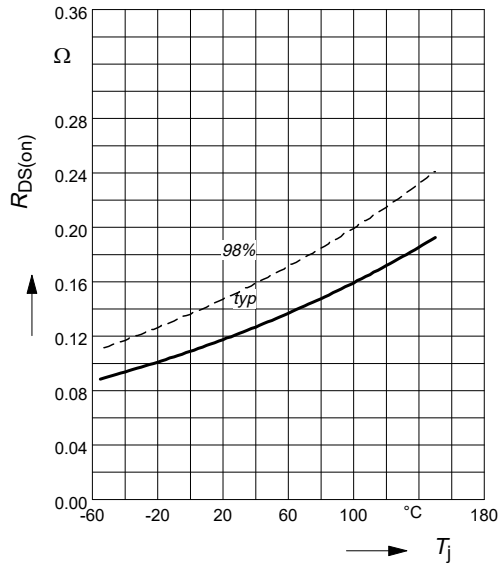
I_D=f (V_{GS}), V_{DS}≥2xI_Dx$R_{DS(ON)}$
maxparameter: T_p=80μs



V_{GS}(V)

Figure 6: Drain-source On Resistance

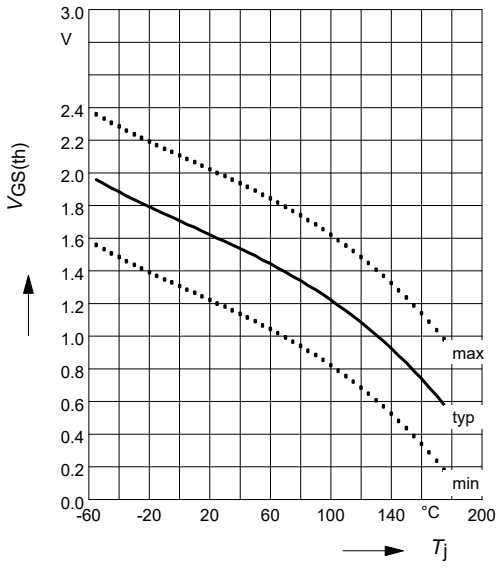
$R_{DS(ON)}$=f(T_J), parameter:I_D=2.6A, V_{GS}=4.5 V



T_J (°C)

Figure 7: Transfer Characteristics

$V_{GS(th)}$=f(T_J), parameter:V_{GS}=V_{DS}, I_D=20μA

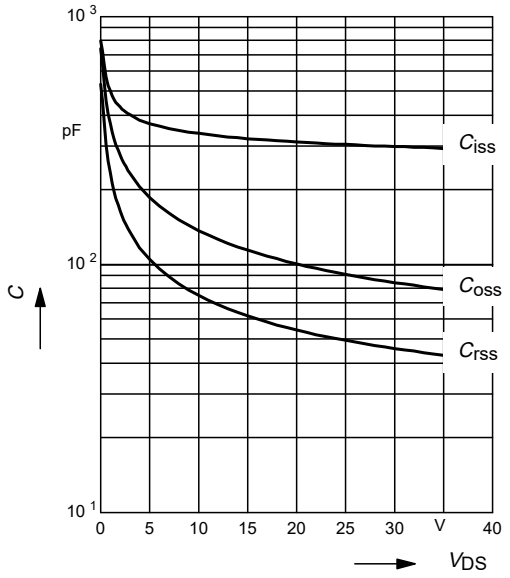


T_J (°C)

Figure 8: Forward Transconductance

6.3Typical characteristic

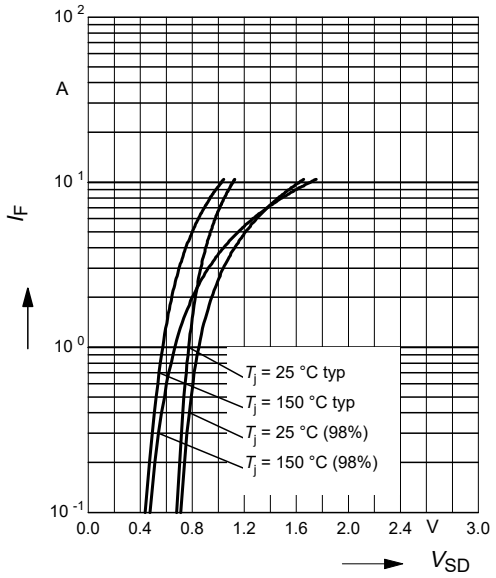
C=f(V_{DS}), parameter:V_{GS}=0V, f=1MHz



V_{DS}(V)

Figure 9: Drain-source On-state Resistance

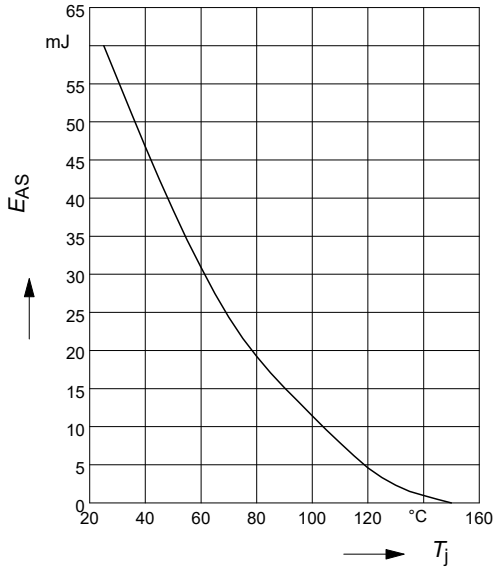
I_F=f(V_{SD}), parameter:T_J=80μs



T_J (°C)

Figure 10: Gate Threshold Voltage

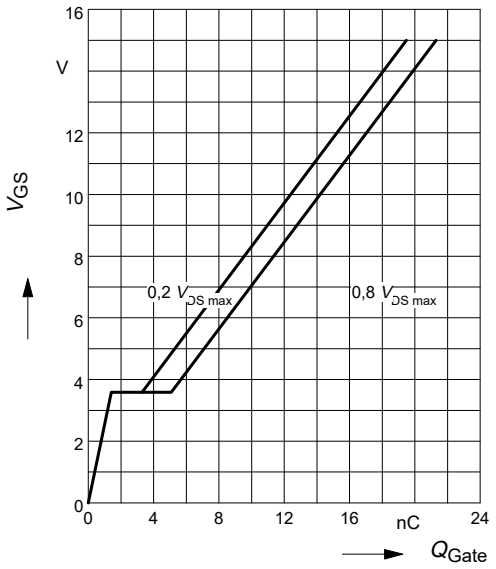
E_{AS}=f(T_J); parameter: I_D=2.6A,V_{DD}=25 V, R_{GS}=25 Ω



T_J (°C)

Figure 11: Capacitances

V_{GS}=f(Q_{gate}); parameter:I_D=2.6A pulsed



Q_{gate} (nC)

Figure 12: Forward Characteristics Of Reverse Diode

6.4Typical characteristic

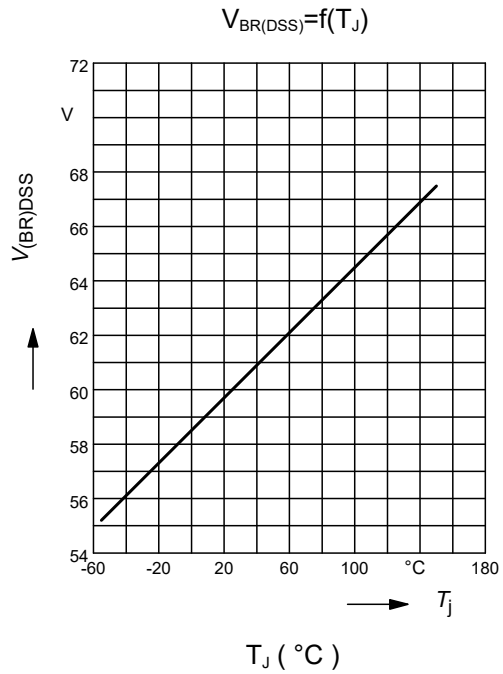
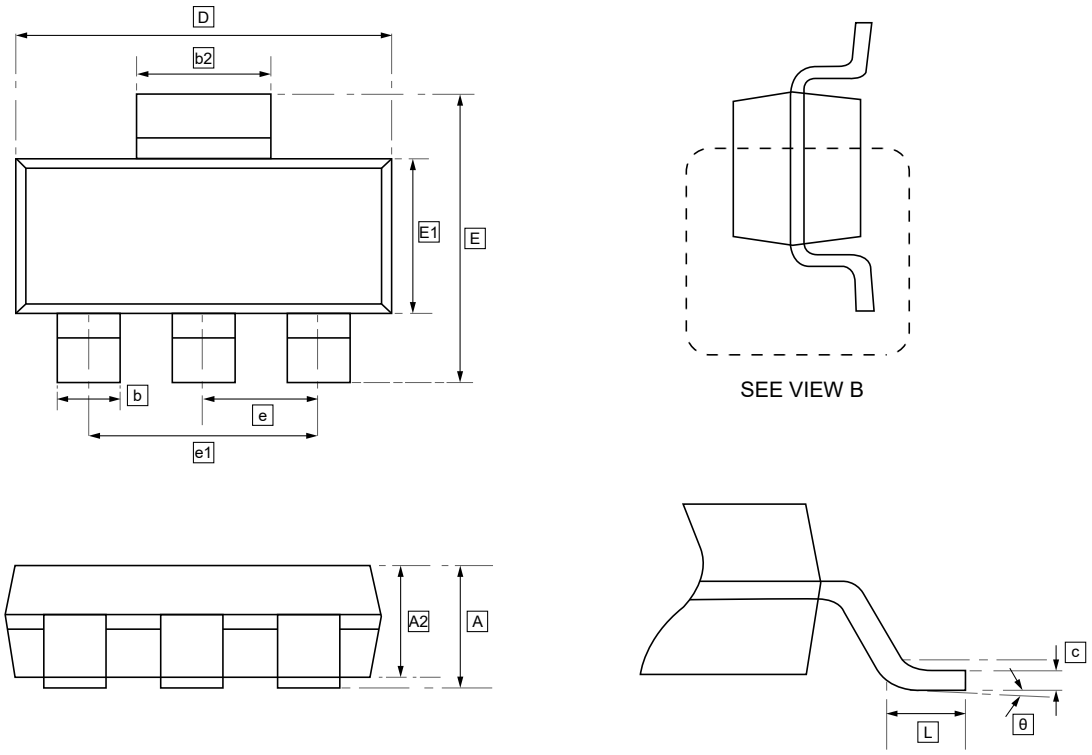


Figure 13: Drain-source Breakdown Voltage

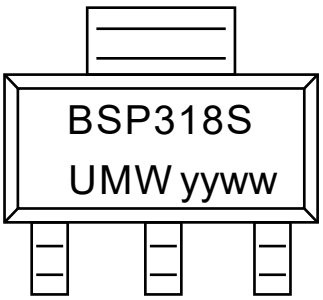
7.SOT-223 Package Outlie Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	b2	c	D	E	E1	e	e1	L	θ
Min	1.50	0.02	1.50	0.66	2.90	0.23	6.30	6.70	3.30	2.30	4.60	0.90	0°
Max	1.80	0.10	1.70	0.84	3.10	0.33	6.70	7.30	3.70	BSC	BSC	1.10	8°

8.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW BSP318S	SOT-223	2500	Tape and reel

9.Disclaimer

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