

## -60V -4A P-Channel Enhancement Mode Power MOSFET

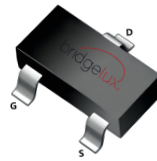
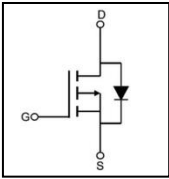
### Features

- $R_{DS(ON)} \leq 170m\Omega$  @ $V_{GS} = -10V$
- Advanced trench technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired

### Application

- Load Switch
- PWM Application
- Power management

### SYMBOL


**SOT-23**

### ASSEMBLY MESSAGE

Product Name	Package	Packaging
BXT1700P06M	SOT-23	Reel

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Rating	Unit	
		SOT-23		
Drain-Source Voltage	$V_{DSS}$	-60	V	
Drain Current	$I_D$	Continuous ( $T_C = 25^\circ C$ )	-4	A
		Continuous ( $T_C = 100^\circ C$ )	-2.8	A
Drain Current	$I_{DM}$	-16	A	
Single Pulsed Avalanche Energy	EAS	4.5	mJ	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Power Dissipation	$T_C = 25^\circ C$ $P_D$	1.5	W	
Maximum Junction Temperature	$T_J$	150	$^\circ C$	
Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ C$	

Note: 1. Repetitive Rating; Pulse width limited by maximum junction temperature

### THERMAL CHARACTERISTICS

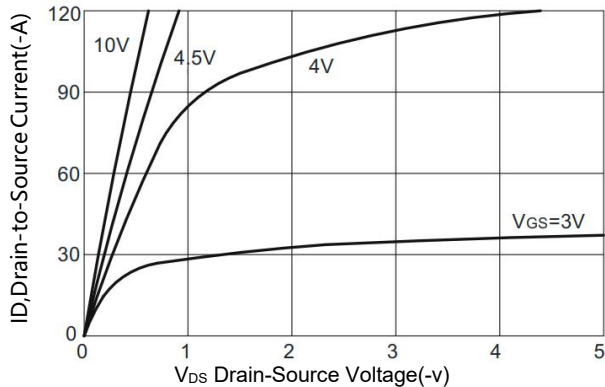
Parameter	Symbol	Max.	Unit
		SOT-23	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	83.3	$^\circ C / W$

**ELECTRICAL CHARACTERISTICS** ( $T_J=25^{\circ}\text{C}$ , unless otherwise Noted)

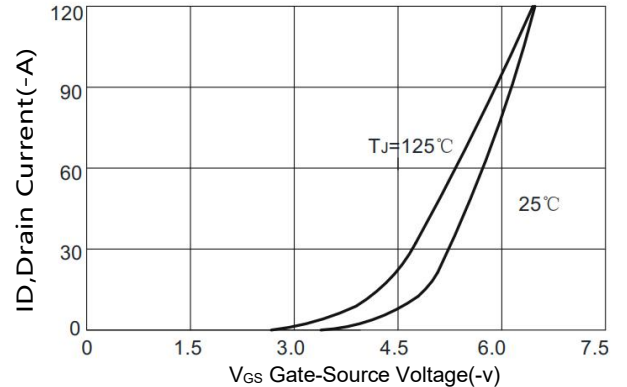
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			-1	$\mu A$
Gate-Body Leakage Current, Forward	$I_{GSS}$	$V_{GS}=20V$			1	$\mu A$
Gate-Body Leakage Current, Reverse		$V_{GS}=-20V$			-1	$\mu A$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.5		-3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-2A$		140	170	$m\Omega$
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{ISS}$	$V_{DS}=-30V, V_{GS}=0V,$ $f=1.0MHz$		910		$\mu F$
Output Capacitance	$C_{OSS}$			82		$\mu F$
Reverse Transfer Capacitance	$C_{RSS}$			35		$\mu F$
<b>SWITCHING PARAMETERS</b>						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=-30V, I_D=-2A, V_{GS}$ $= -10V, R_G=7.5\Omega$		9		ns
Turn-ON Rise Time	$t_R$			5		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			30		ns
Turn-OFF Fall-Time	$t_F$			6		ns
Total Gate Charge(Note2)	$Q_G$	$V_{DS} = -30V, V_{GS} = -10V,$ $I_D = -2A$		22		nC
Gate Source Charge	$Q_{GS}$			3		nC
Gate Drain Charge	$Q_{GD}$			7		nC
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=-4A, V_{GS}=0V$			-1.5	V
Diode Continuous Forward Current	$I_S$				-4	A
Maximum Pulsed Drain to Source Diode Forward Current	$I_{SM}$				-16	A

Note: 2. Essentially independent of operating temperature

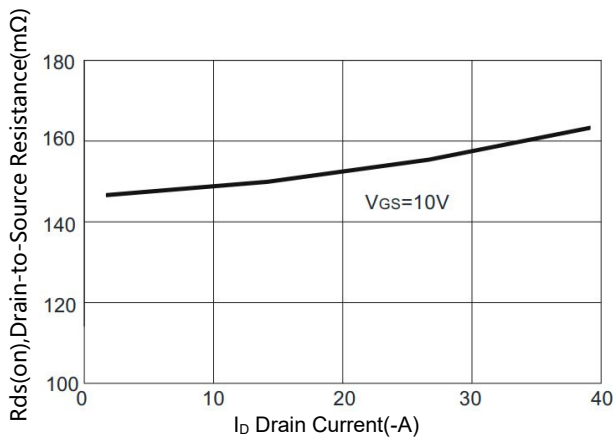
**TYPICAL CHARACTERISTICS**



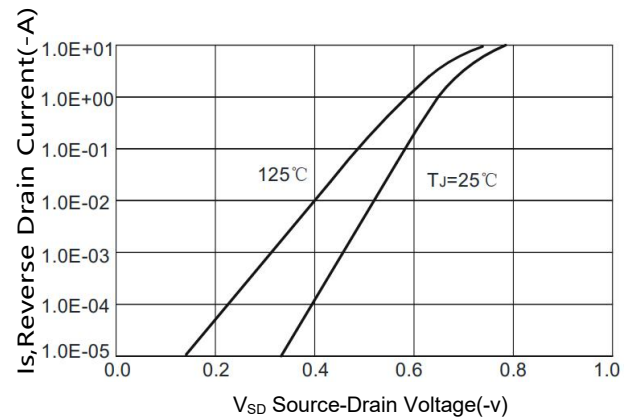
**Figure1. Typical Output Characteristics**



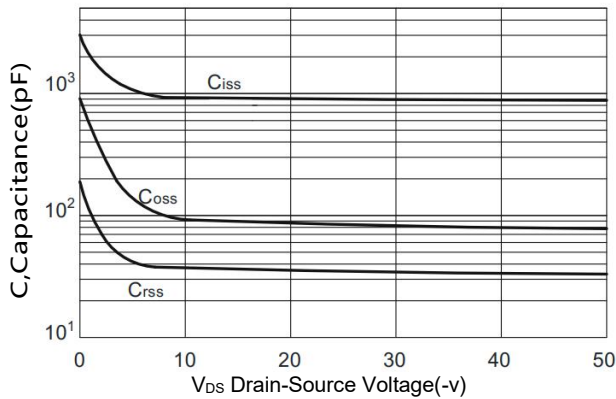
**Figure2. Typical Transfer Characteristics**



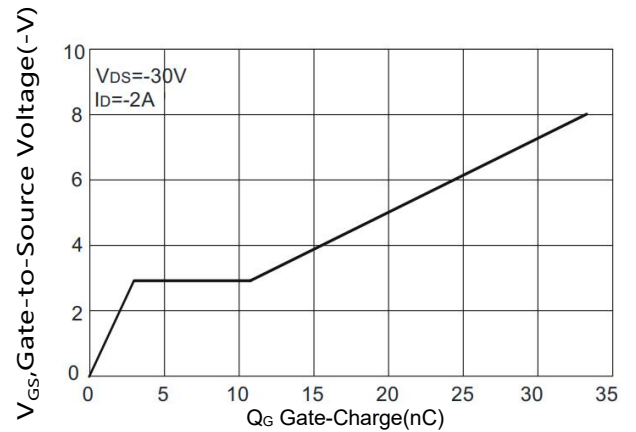
**Figure3. On-Resistance versus Drain Current**



**Figure4. Diode forward voltage versus Current**

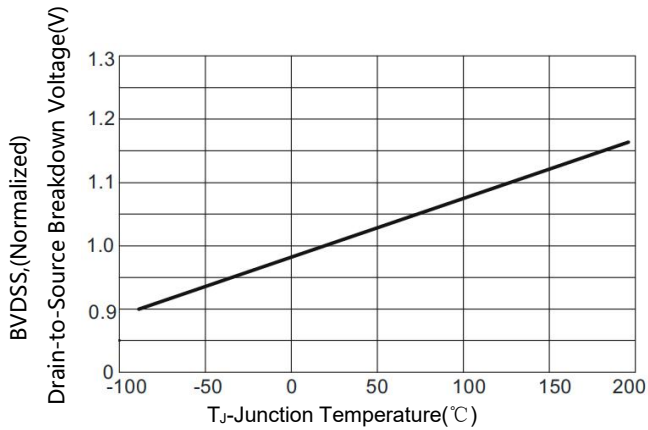


**Figure5. Typical Capacitance versus VDS**

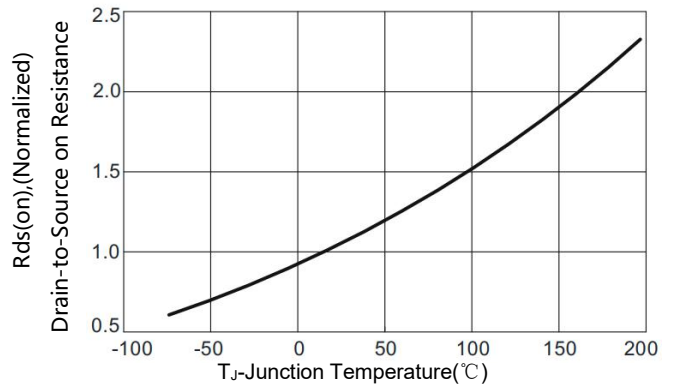


**Figure6. Typical Gate Charge versus VGS**

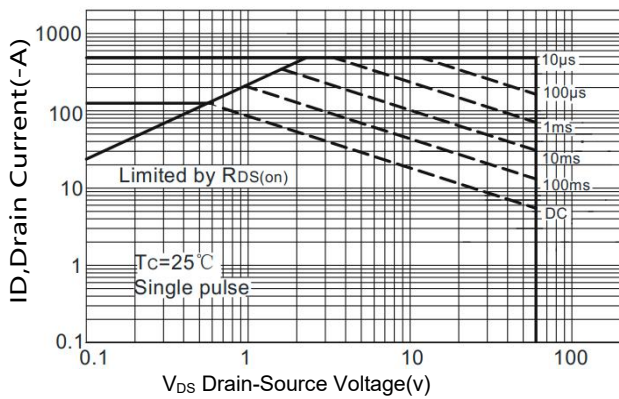
**TYPICAL CHARACTERISTICS(Cont.)**



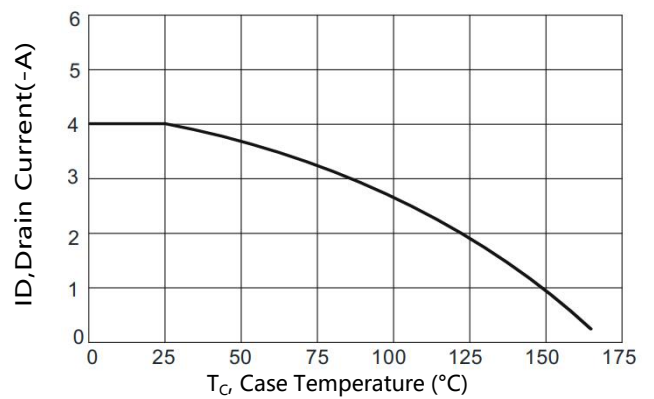
**Figure7.  $BV_{DSS}$  Variation with Temperature**



**Figure8. On-Resistance Variation with Temperature**

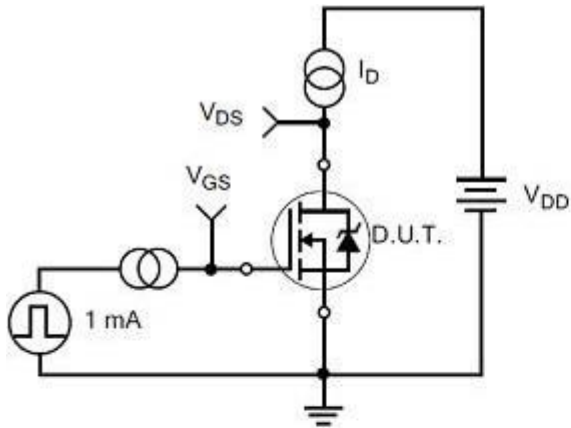


**Figure9. Maximum Safe Operating Area**

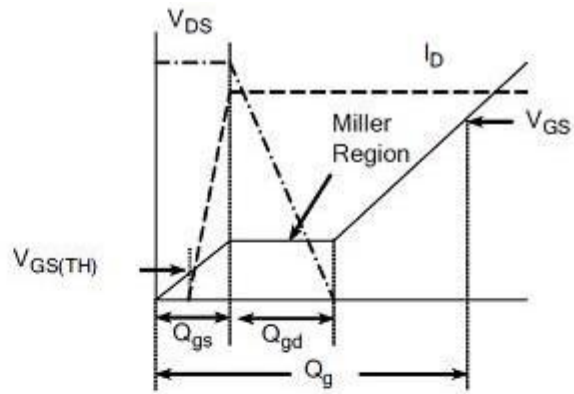


**Figure10. Maximum Continuous Drain Current versus Case Temperature**

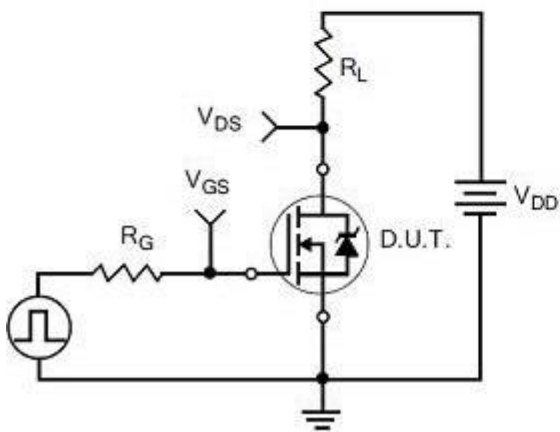
TEST CIRCUITS AND WAVEFORMS



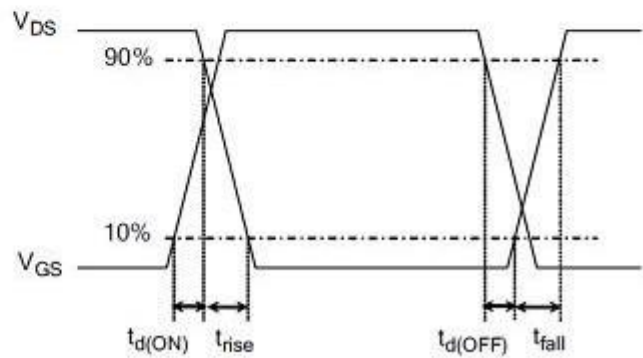
Gate Charge Test Circuit



Gate Charge Waveform

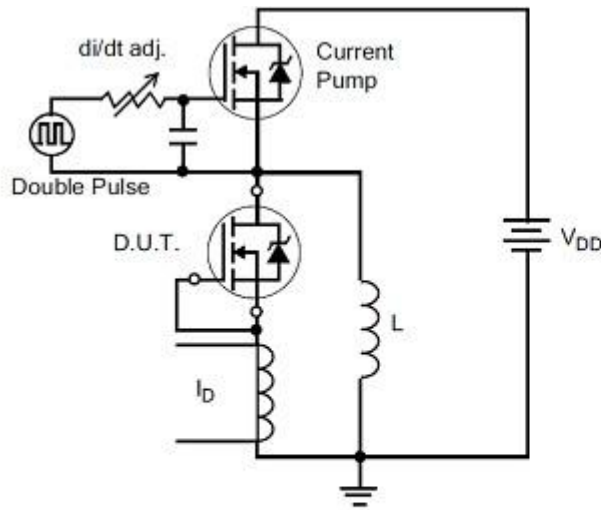


Resistive Switching Test Circuit

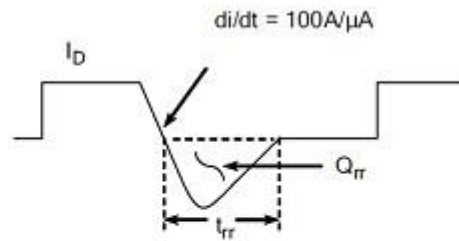


Resistive Switching Waveforms

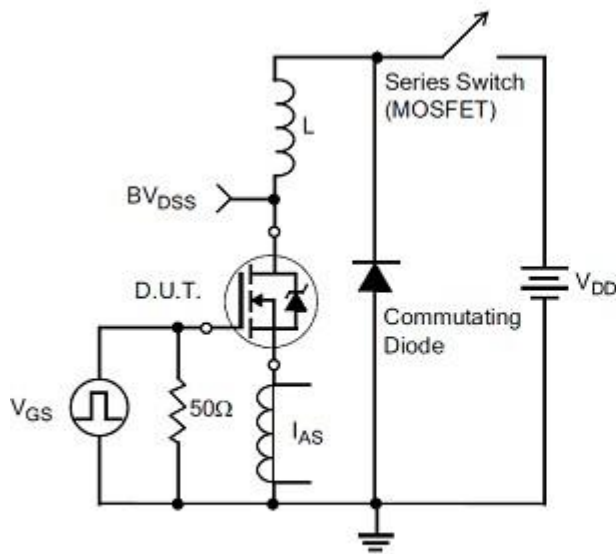
TEST CIRCUITS AND WAVEFORMS(Cont.)



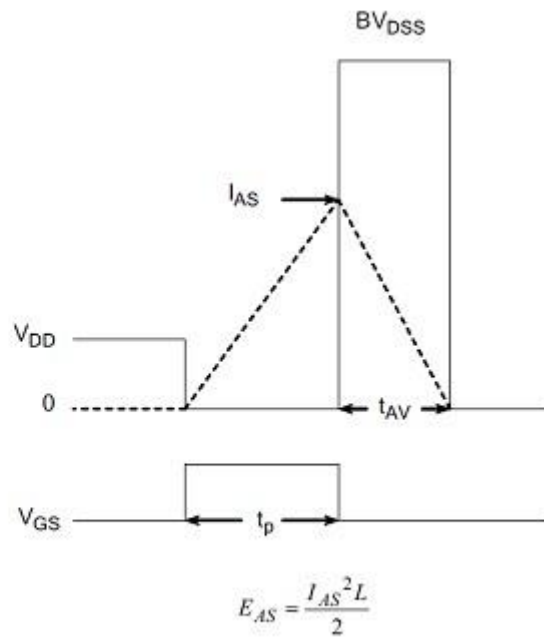
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform

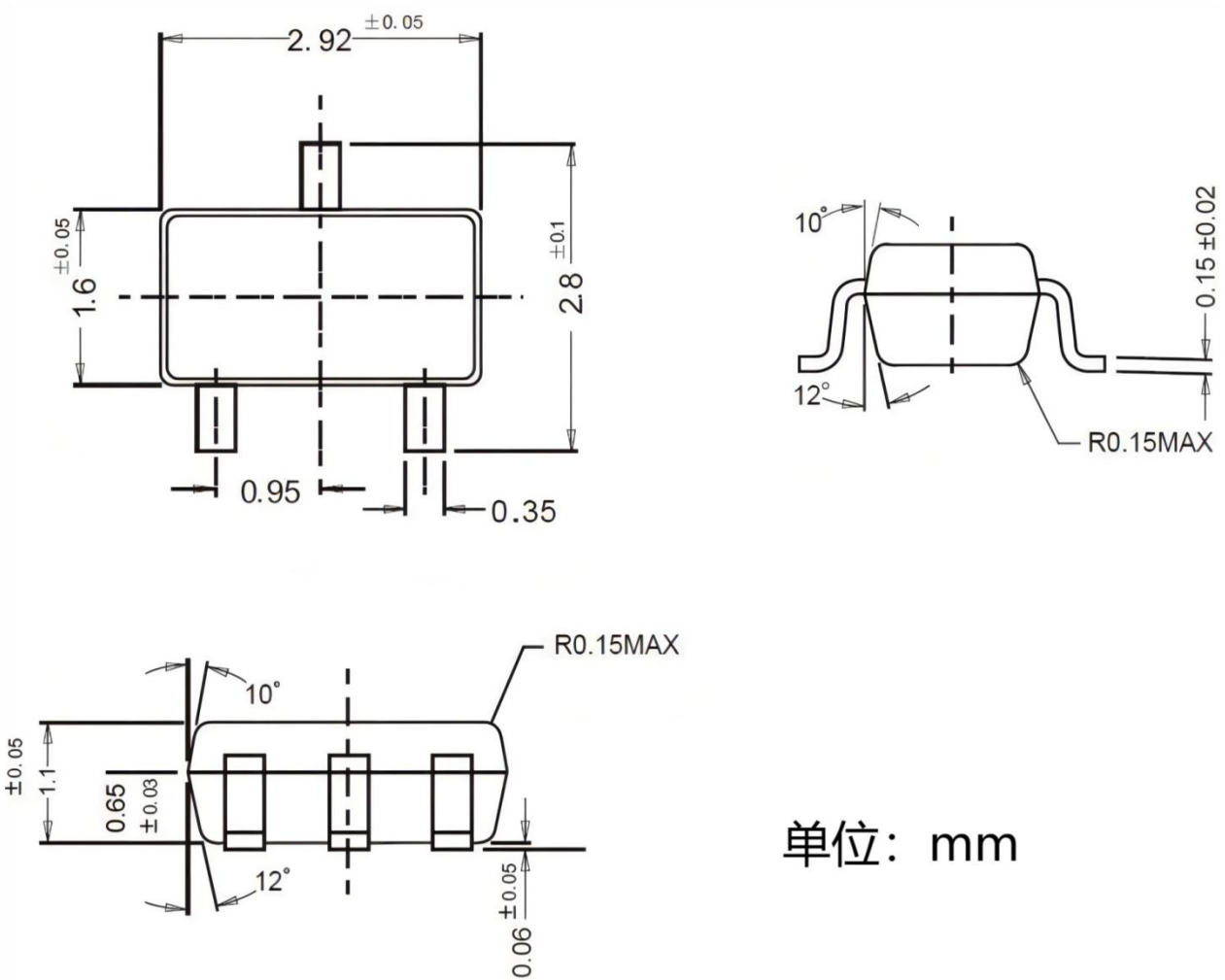


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

SOT-23 Package



单位: mm

**Revision history****Document revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
29-Oct-2021	1.0	First release
10-Jan-2022	1.1	Update parameter



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