-20V -3A P-Channel Enhancement Mode Power MOSFET

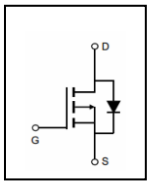
General Description

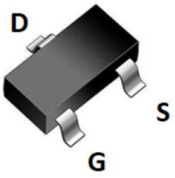
This Power MOSFET has been developed using advanced trench process, which is specifically designed to minimize input capacitance and gate charge. This renders the device suitable for use as primary switch in advanced high-efficiency isolated DC-DC converters for telecom and computer applications, and applications with low gate charge driving requirements.

FEATURES

- RDSON≤ 110 mΩ @Vgs=-4.5V, Id=-3A
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

SYMBOL





SOT-23 top view

ASSEMBLY MESSAGE

Product Name	Package	Packaging
BXT1100P02M	SOT-23	Reel

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Parameter		Symbol	Rating	Unit
			SOT-23	
Drain-Source Voltage		V_{DSS}	-20	V
Drain Current	Continuous (T_C = 25°C)	I_D	-3	A
	Continuous (T_C = 100°C)		-1.9	A
Drain Current	Pulsed (Note1)	I_{DM}	-10	A
Gate-Source Voltage		V_{GSS}	±10	V
Power Dissipation	T_C =25°C	P_D	1.25	W
Maximum Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°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	$R_{\theta JA}$	100	°C / W

ELECTRICAL CHARACTERISTICS（T_J=25℃,unless otherwise Noted）

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V, ID= - 250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS=-20V, VGS=0V			-1	uA
Gate-Body Leakage Current, Forward	I_{GSS}	VGS=10V			100	nA
Gate-Body Leakage Current, Reverse		VGS=-10V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	VDS=VGS, ID=-250μA	-0.4	-	-1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	VGS=-4.5V, ID=-3.0A		64	110	mΩ
		VGS=-2.5V, ID=-2.0A		89	140	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	VDS=-6V, VGS=0V, f=1.0MHz		417		pF
Output Capacitance	C_{OSS}			222		pF
Reverse Transfer Capacitance	C_{RSS}			85		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	VDD=-6V, ID=-1A, VGS = -4.5V, RG=1Ω		13		ns
Turn-ON Rise Time	t_R			37		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			42		ns
Turn-OFF Fall-Time	t_F			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	IS=-3A, VGS=0V			-1.2	V
Diode Continuous Forward Current	I_S				-3	A

Note： 2. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS

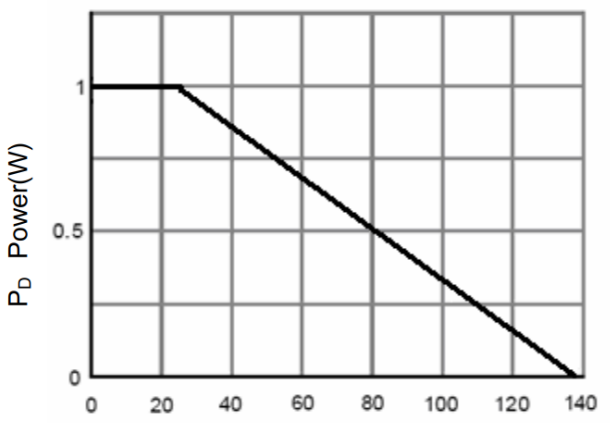


Figure 1. Power Dissipation

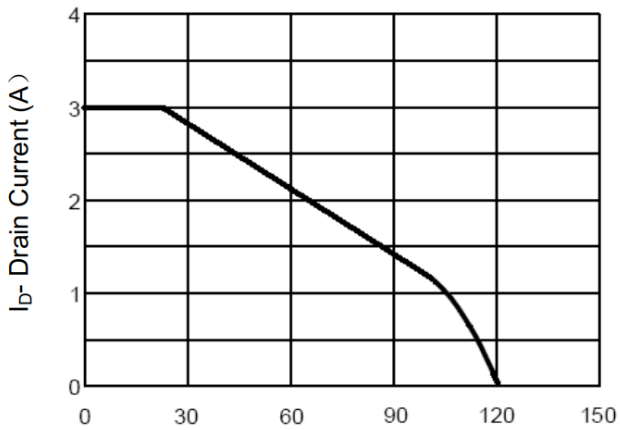


Figure 2. Drain Current

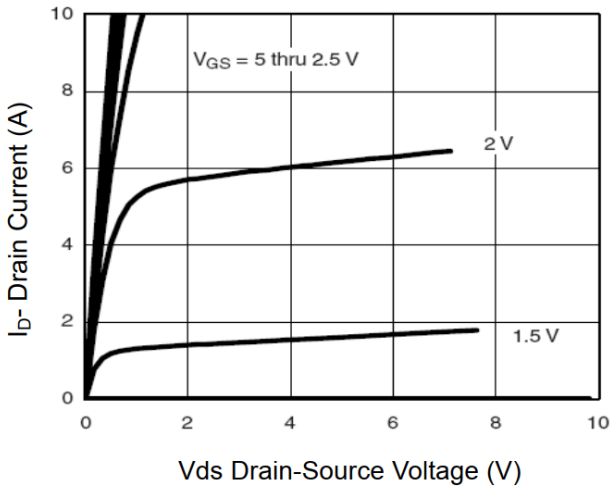


Figure 3. Output Characteristics

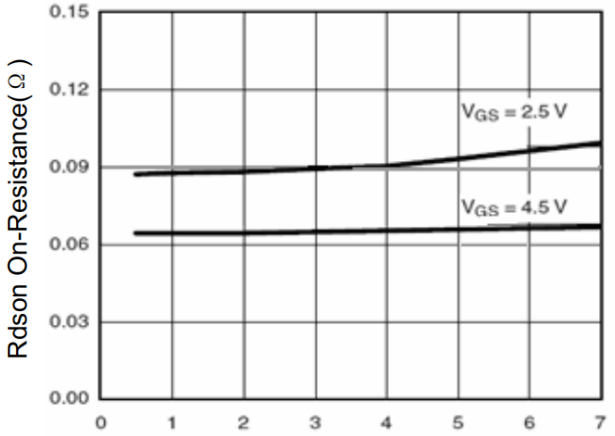


Figure 4. Drain-Source On-Resistance

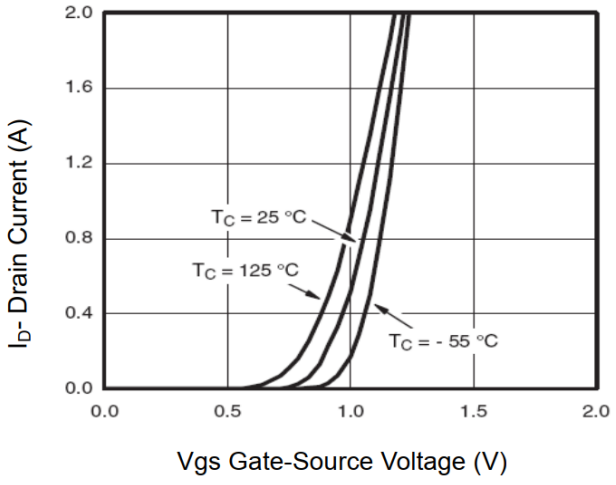


Figure 5. Transfer Characteristics

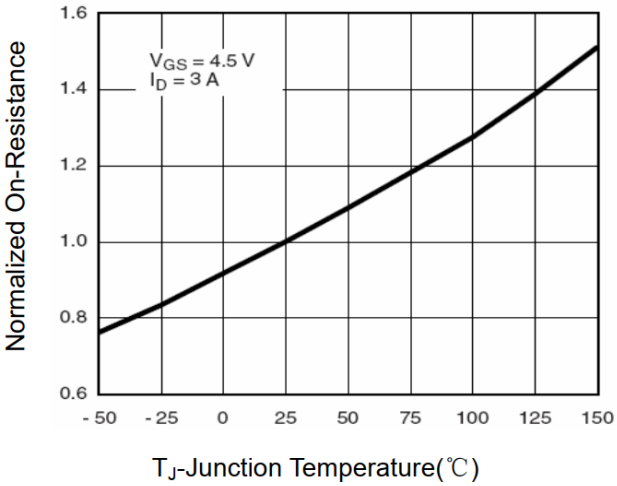


Figure 6. Drain-Source On-Resistance

TYPICAL CHARACTERISTICS(Cont.)

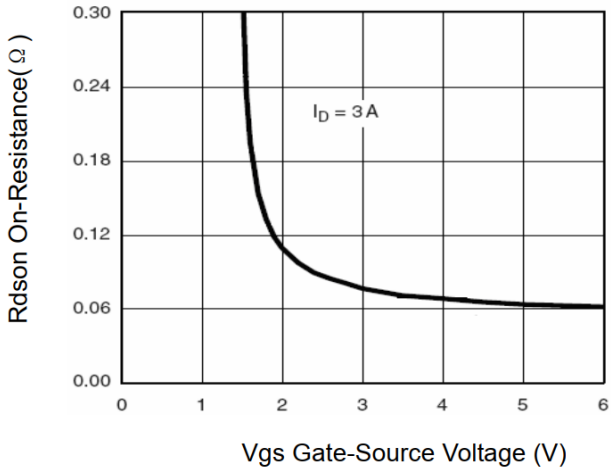


Figure 7. Rdson vs Vgs

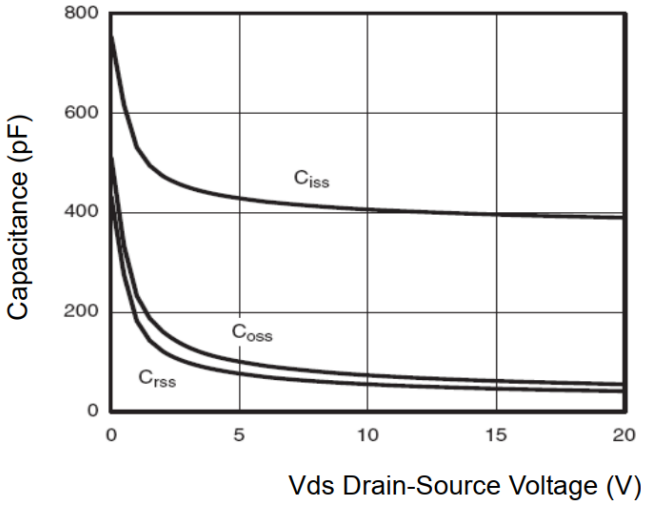


Figure 8. Capacitance vs Vds

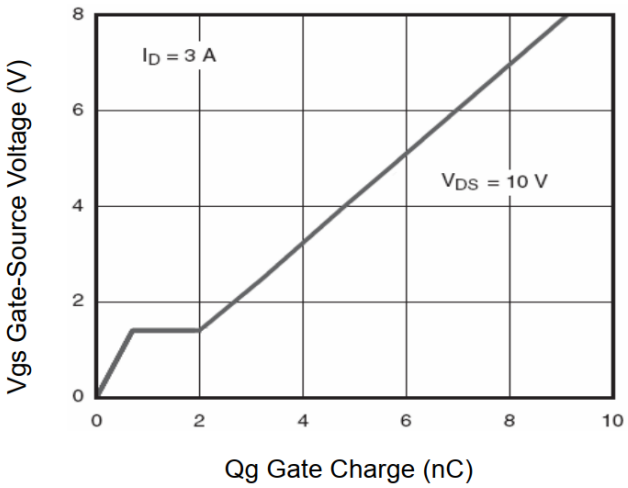


Figure 9. Gate Charge

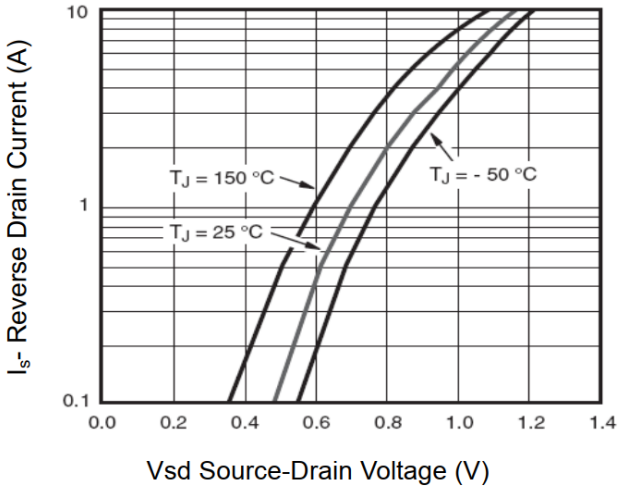
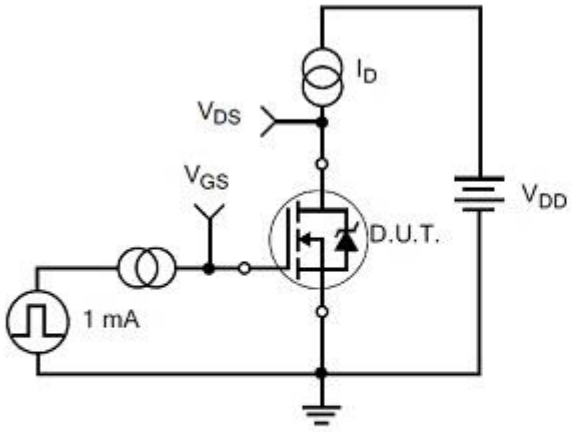
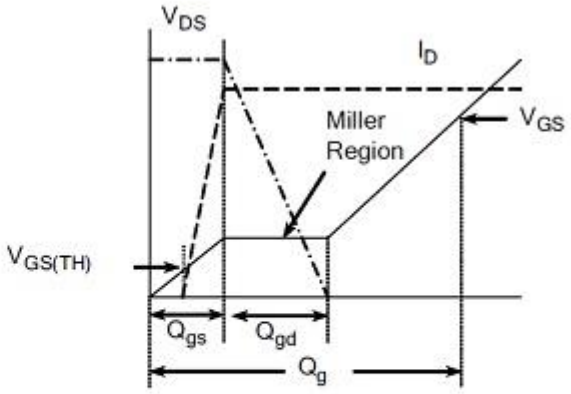


Figure 10. Source- Drain Diode Forward

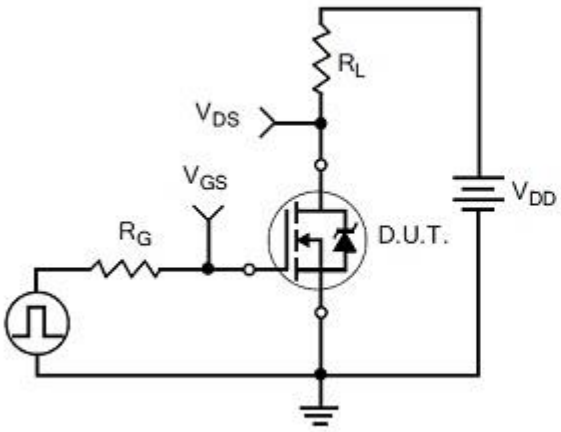
TEST CIRCUITS AND WAVEFORMS



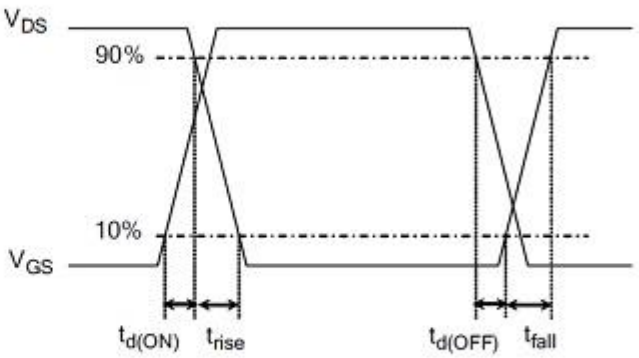
Gate Charge Test Circuit



Gate Charge Waveform

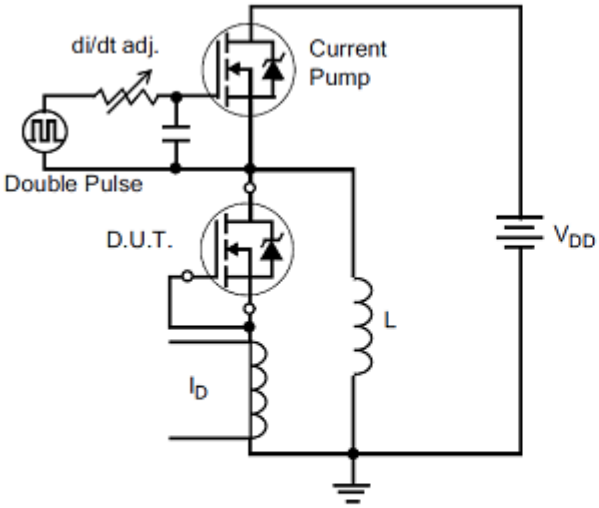


Resistive Switching Test Circuit

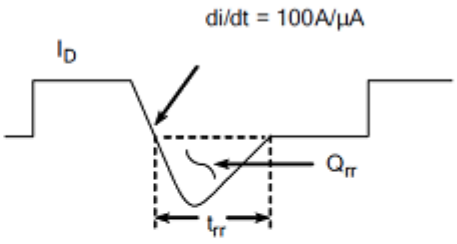


Resistive Switching Waveforms

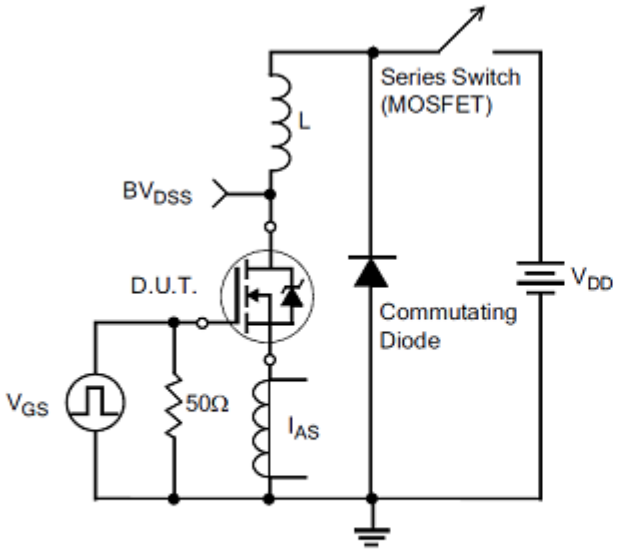
TEST CIRCUITS AND WAVEFORMS(Cont.)



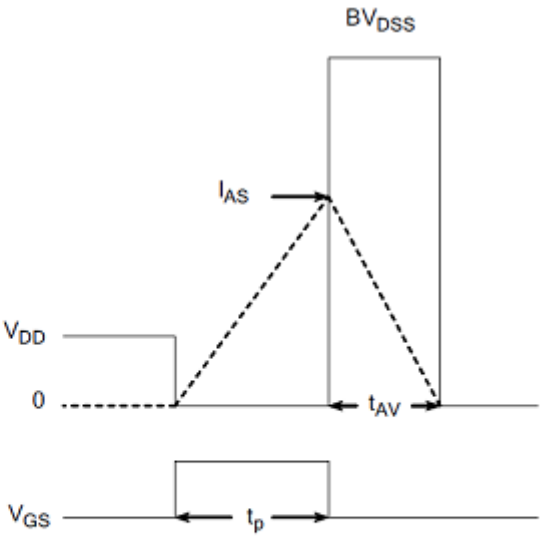
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform



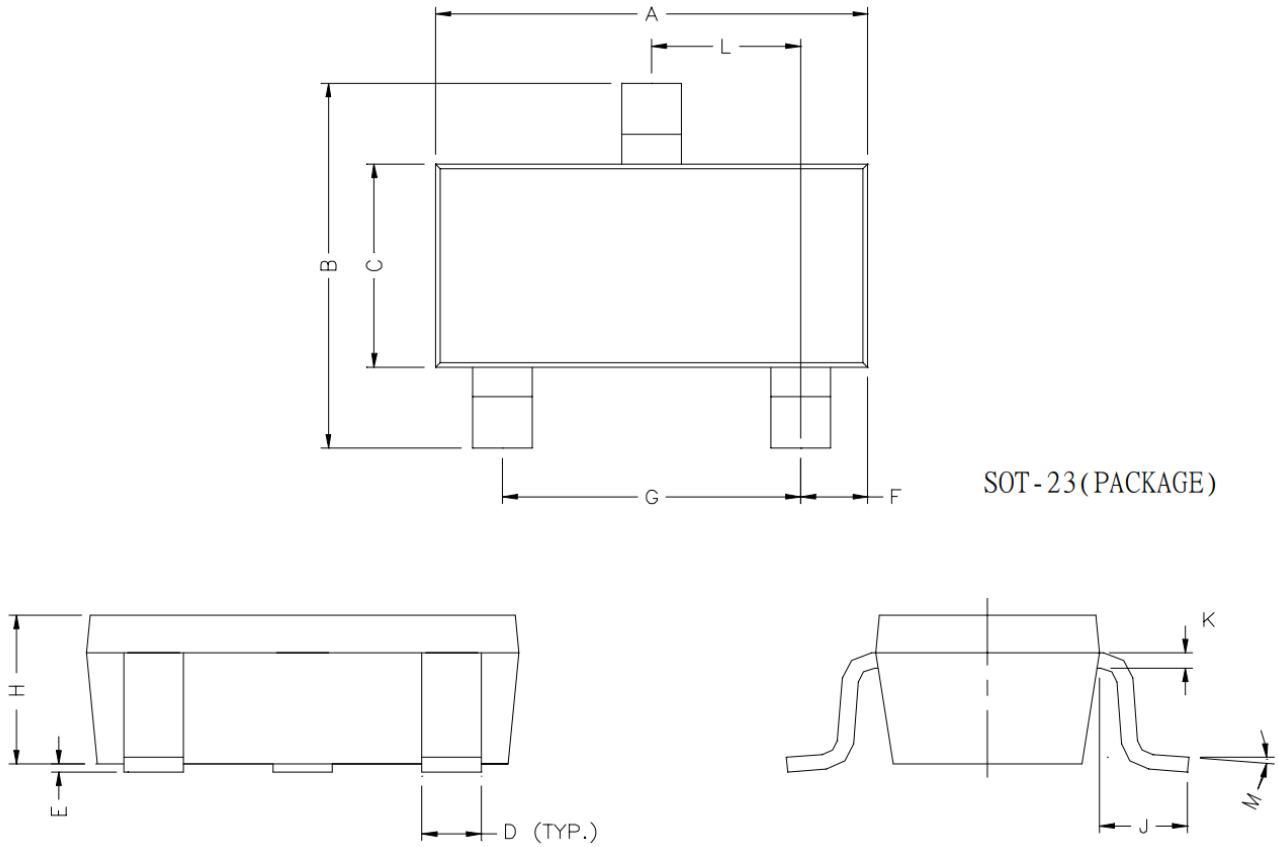
Unclamped Inductive Switching Test Circuit



$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

Unclamped Inductive Switching Waveforms

SOT-23 Package



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

Revision history

Document revision history

Date	Revision	Changes
25-Oct-2020	1.0	First release
10-Nov-2020	1.1	Add the package dimensions

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