

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
-200V	25Ω @ $V_{GS} = 10V$	-200mA

Description and Applications

This new generation trench MOSFET features a unique structure combining the benefits of low on-resistance and fast switching, making it ideal for high efficiency power management applications.

- Active clamping of primary side MOSFETs in 48 Volt DC-DC converters

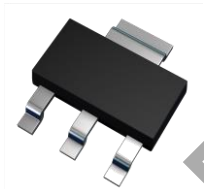
Features and Benefits

- High Voltage
- Low On-Resistance
- Fast Switching Speed
- Low Gate Drive
- Low Threshold
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

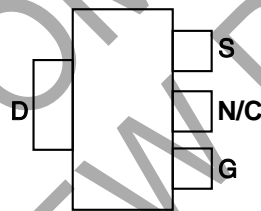
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish e3
- Weight: 0.112 grams (Approximate)

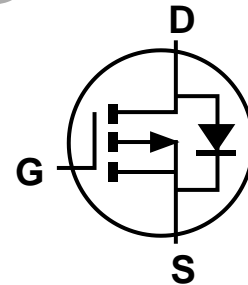
SOT223 (Type DN)



Top View



Pin Out - Top View



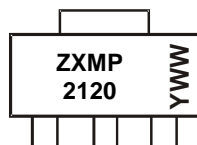
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZXMP2120G4TA	SOT223 (Type DN)	1,000	Tape & Reel
ZXMP2120G4TC	SOT223 (Type DN)	4,000	Tape & Reel

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 - See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



ZXMP2120 = Product Type Marking Code
 YWW = Date Code Marking
 Y or Y = Last Digit of Year (ex: 2 = 2022)
 WW or WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-200	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (V _{GS} = 10V; T _A = +25°C) (Note 5)	I _D	-200	mA
Pulsed Drain Current (Note 6)	I _{DM}	-1	A
Pulsed Source Current (Body Diode) (Note 6)	I _{SM}	-1	A

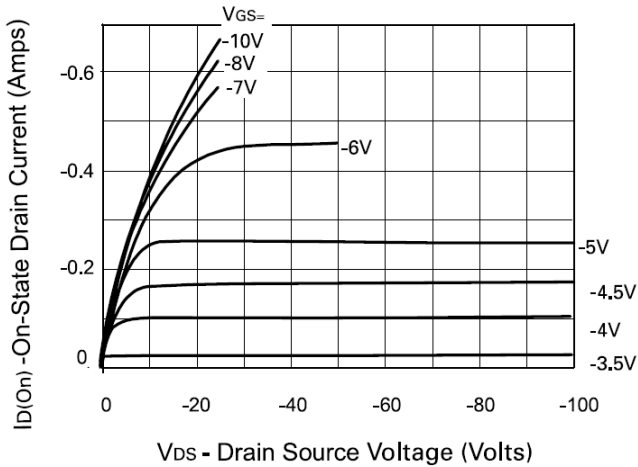
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation at T _A = +25°C (Note 5)	P _D	2.0	W
Linear Derating Factor		1.6	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	62.5	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

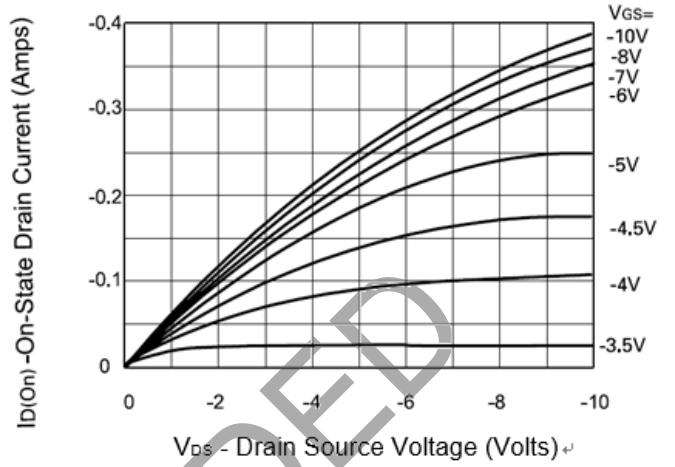
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-200	—	—	V	V _{GS} = 0V, I _D = -1mA
Zero Gate Voltage Drain Current	I _{BSS}	—	—	-10, -100	µA	V _{DS} = -200V, V _{GS} = 0V V _{DS} = -160V, V _{GS} = 0V, T = +125°C
Gate-Source Leakage	I _{GSS}	—	—	20	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	-1.5	—	-3.5	V	V _{DS} = V _{GS} , I _D = -1mA
Static Drain-Source On-Resistance (Note 7)	R _{DS(ON)}	—	—	25	Ω	V _{GS} = -10V, I _D = -150mA
Forward Transconductance (Notes 7 & 8)	g _{fs}	50	—	—	mS	V _{DS} = -25V, I _D = -150mA
On-State Drain Current (Note 7)	I _{D(ON)}	-300	—	—	mA	V _{DS} = -25V, V _{GS} = -10V
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 8)	C _{iss}	—	—	100	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance (Note 8)	C _{oss}	—	—	25	pF	
Reverse Transfer Capacitance (Note 8)	C _{rss}	—	—	7	pF	
Turn-On Delay Time (Notes 8 & 9)	t _{D(ON)}	—	—	7	ns	V _{DD} = -25V, I _D = -150mA
Turn-On Rise Time (Notes 8 & 9)	t _r	—	—	15	ns	
Turn-Off Delay Time (Notes 8 & 9)	t _{D(OFF)}	—	—	12	ns	
Turn-Off Fall Time (Notes 8 & 9)	t _f	—	—	15	ns	

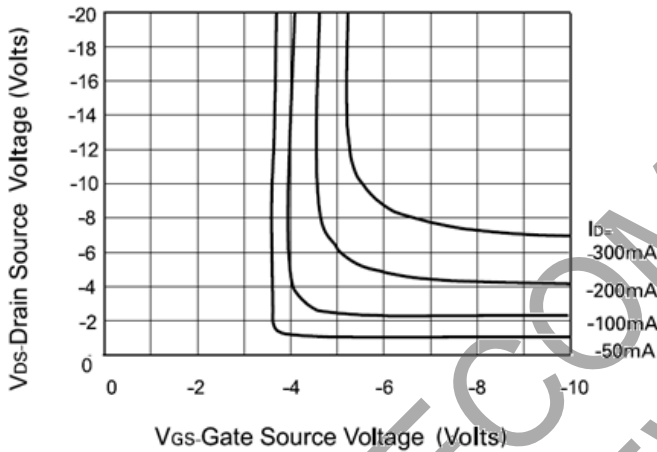
- Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 6. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
 7. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.
 8. Sample test.
 9. Switching characteristics are independent of operating junction temperature.



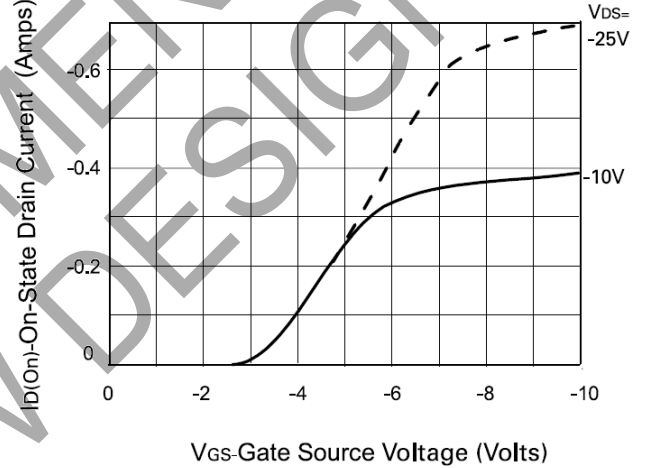
Output Characteristics



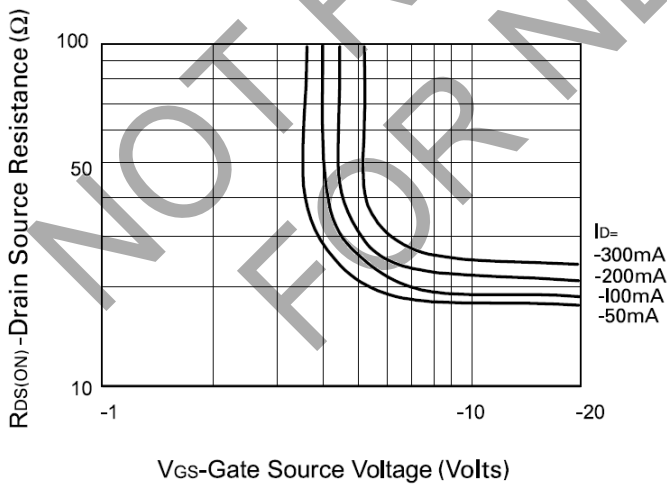
Saturation Characteristics



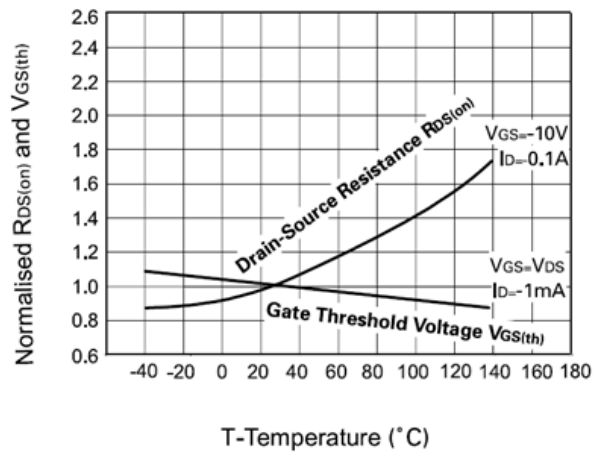
Voltage Saturation Characteristics



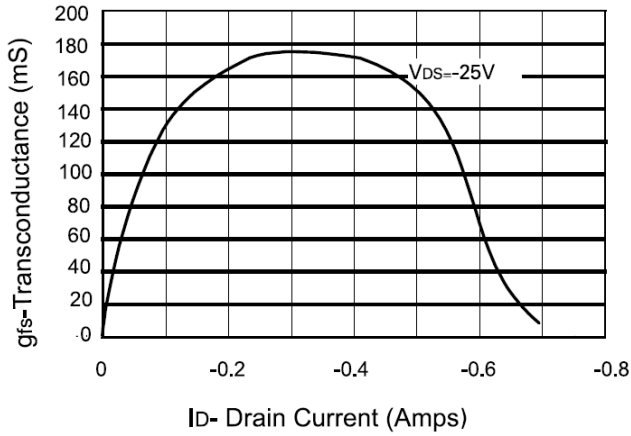
Transfer Characteristics



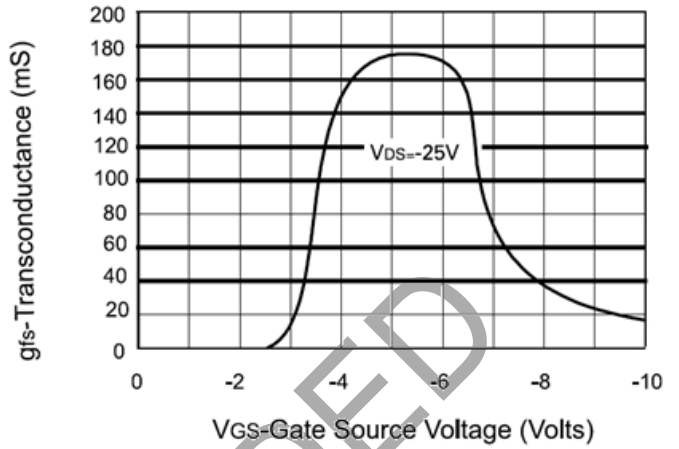
On-resistance vs gate-source voltage



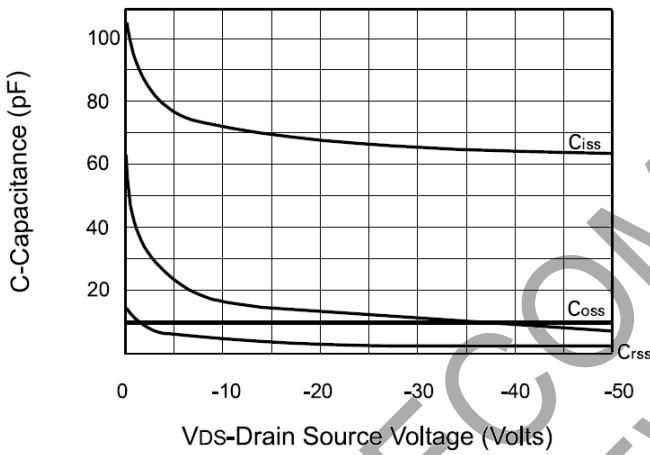
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature



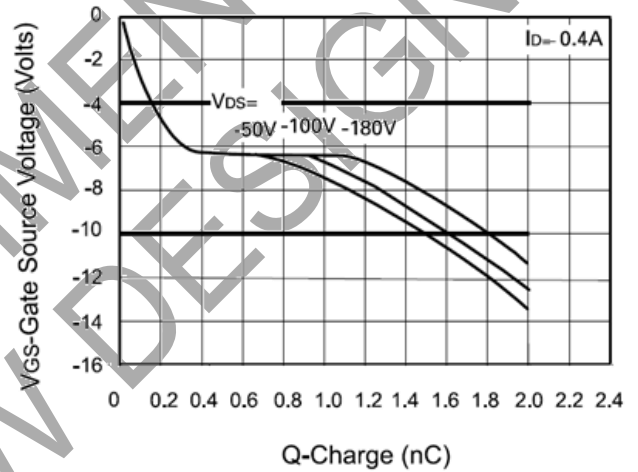
Transconductance v drain current



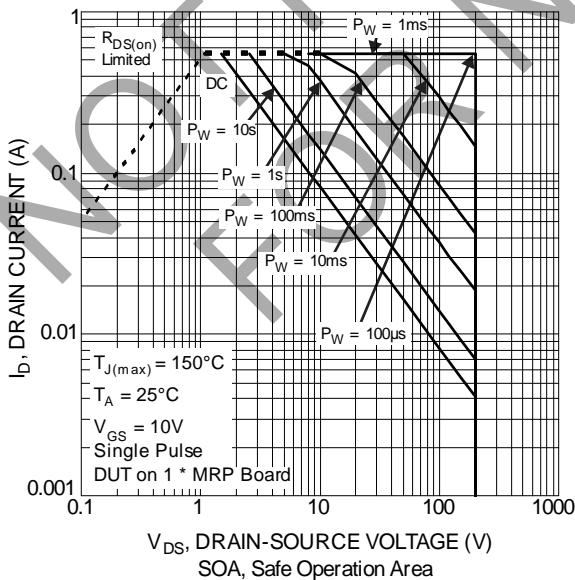
Transconductance v gate-source voltage

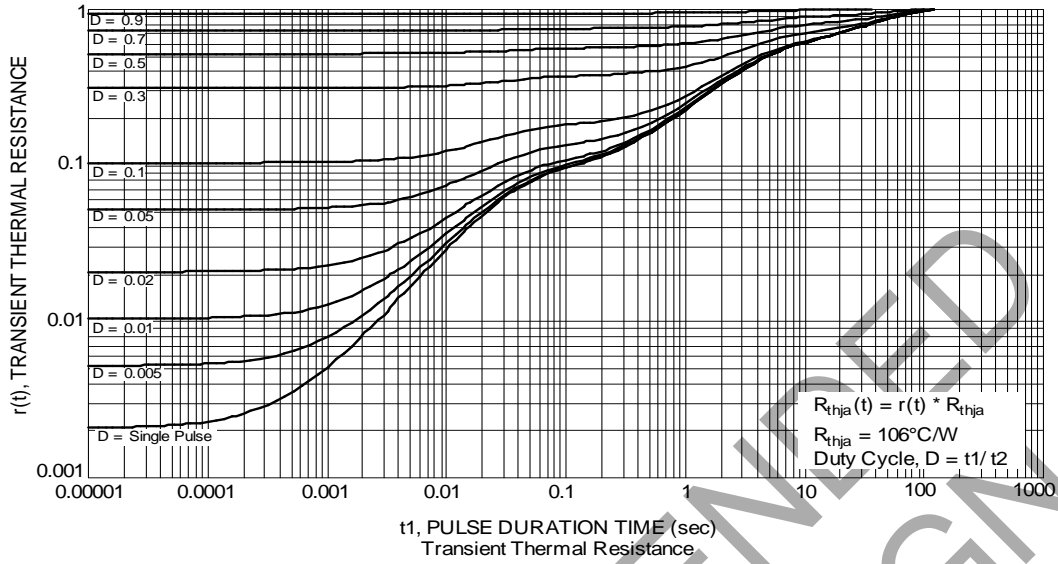


Capacitance v drain-source voltage



Gate charge v gate-source voltage



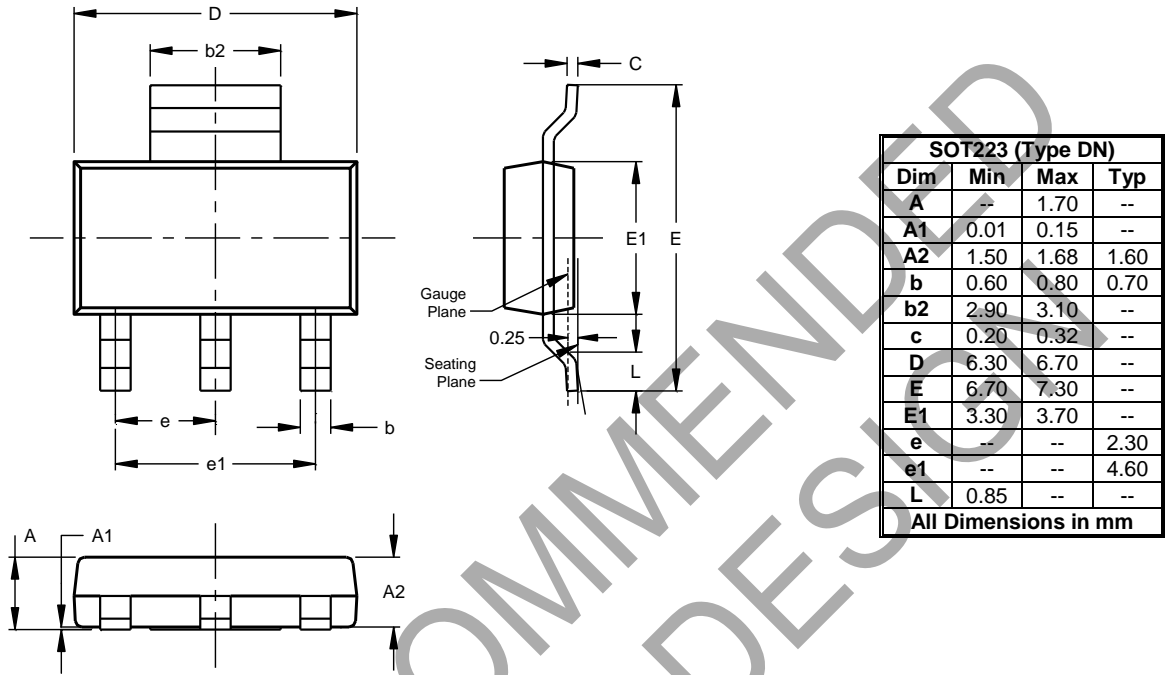


NOT RECOMMENDED FOR NEW DESIGN

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

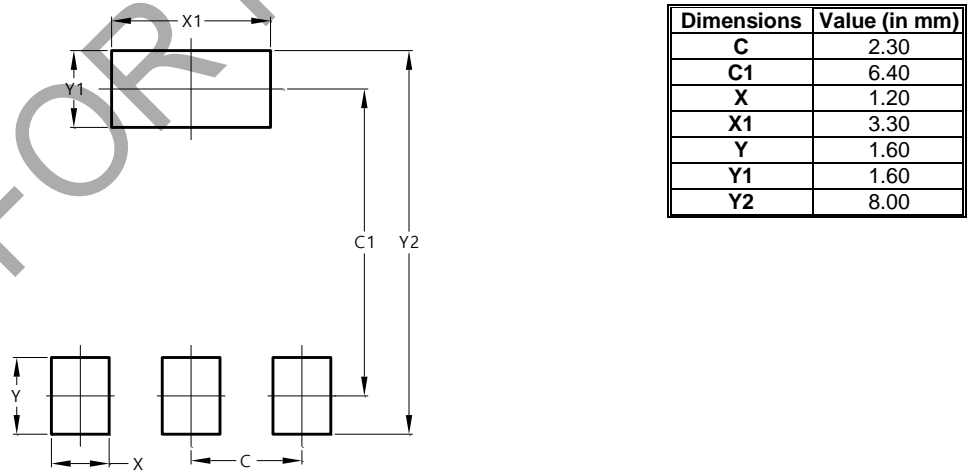
SOT223 (Type DN)



Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223 (Type DN)



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