

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
-20V	92mΩ @ V _{GS} = -4.5V	-3.6A
	138mΩ @ V _{GS} = -2.5V	-2.9A

Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Battery managements
- Load switches
- Battery protections

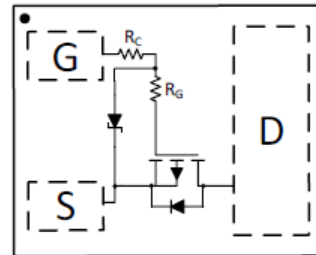
Features and Benefits

- Low Q_g & Q_{gd}
 - Small Footprint
 - Low Profile 0.2mm Height
 - Totally Lead-Free & Fully 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](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**
- <https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: X4-DSN0607-3
- Terminal Connections: See Diagram Below
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiAu. Solderable per MIL-STD-202, Method 208 (e4)
- UBM Opening: 250μm x 150μm/500μm x 150μm
- Weight: 0.00019 grams (Approximate)

X4-DSN0607-3



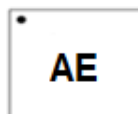
Top View
Equivalent Circuit

Ordering Information (Note 4)

Orderable Part Number	Package	Pitch	Packing	
			Qty.	Carrier
DMP2085UCA3-7	X4-DSN0607-3	4mm	3000	Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - 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



AE = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-20	V
Gate-Source Voltage	V _{GSS}	-20	V
Continuous Drain Current (Note 5) V _{GS} = -4.5V	I _D	T _A = +25°C -3.6	A
		T _A = +70°C -2.9	
Continuous Drain Current (Note 5) V _{GS} = -2.5V	I _D	T _A = +25°C -2.9	A
		T _A = +70°C -2.3	
Pulsed Drain Current (Note 6)	I _{DM}	-14	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P _D	0.64	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 7)	R _{θJA}	201.5	°C/W
Power Dissipation (Note 5)	P _D	1.82	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{θJA}	69.1	°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 (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0, I _D = -250μA
Zero Gate Voltage Drain Current, T _J = +25°C	I _{DSS}	—	—	-100	nA	V _{DS} = -16V, V _{GS} = 0
		—	—	-50		V _{DS} = -5V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	-100	nA	V _{GS} = -6V, V _{DS} = 0
		—	—	-1	mA	V _{GS} = -16V, V _{DS} = 0
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-0.4	-0.75	-1.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	79	92	mΩ	V _{GS} = -4.5V, I _D = -0.4A
		—	103	138		V _{GS} = -2.5V, I _D = -0.4A
		—	137	286		V _{GS} = -1.8V, I _D = -0.1A
Diode Forward Voltage	V _{SD}	—	-0.45	-0.95	V	V _{GS} = 0, I _S = -1mA
		—	-0.69	-0.95		V _{GS} = 0, I _S = -0.4A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	117.6	—	pF	V _{DS} = -10V, V _{GS} = 0 f = 100kHz
Output Capacitance	C _{oss}	—	73.2	—		
Reverse Transfer Capacitance	C _{rss}	—	5.3	—		
Series Gate Resistance	R _g	—	30	—	Ω	—
Series Clamp Resistance	R _C	—	10000	—		
Total Gate Charge	Q _g	—	0.70	—	nC	V _{DS} = -10V, V _{GS} = -4.5V I _D = -0.4A
Gate-Source Charge	Q _{gs}	—	0.28	—		
Gate-Drain Charge	Q _{gd}	—	0.05	—		
Gate Charge at V _{TH}	Q _{G(TH)}	—	0.15	—		
Turn-On Delay Time	t _{D(ON)}	—	105	—	ns	V _{DS} = -10V, V _{GS} = -4.5V R _G = 0, I _D = -0.4A
Turn-On Rise Time	t _r	—	252	—		
Turn-Off Delay Time	t _{D(OFF)}	—	917	—		
Turn-Off Fall Time	t _f	—	668	—		

- Notes:
- Device mounted on FR-4 material with 1inch² (6.45cm²), 2oz. (0.071mm thick) Cu.
 - Repetitive rating, pulse width limited by junction temperature.
 - Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

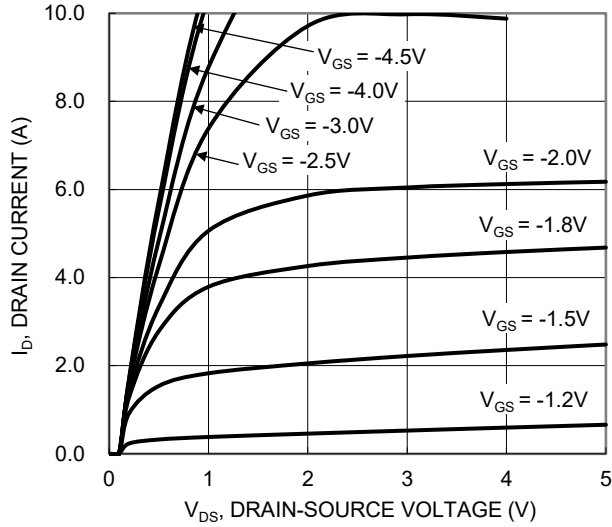


Figure 1. Typical Output Characteristic

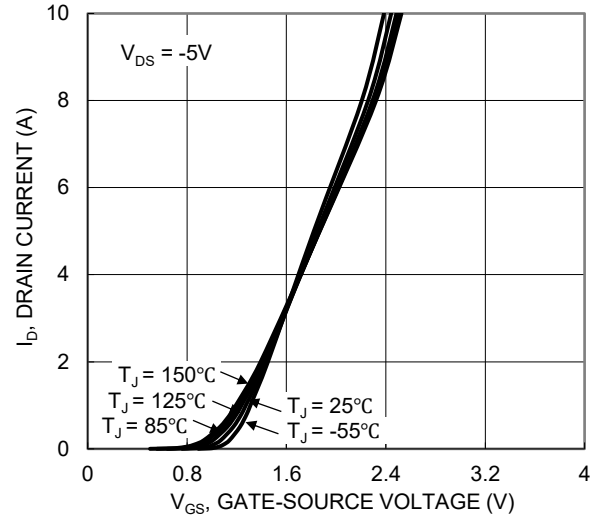


Figure 2. Typical Transfer Characteristic

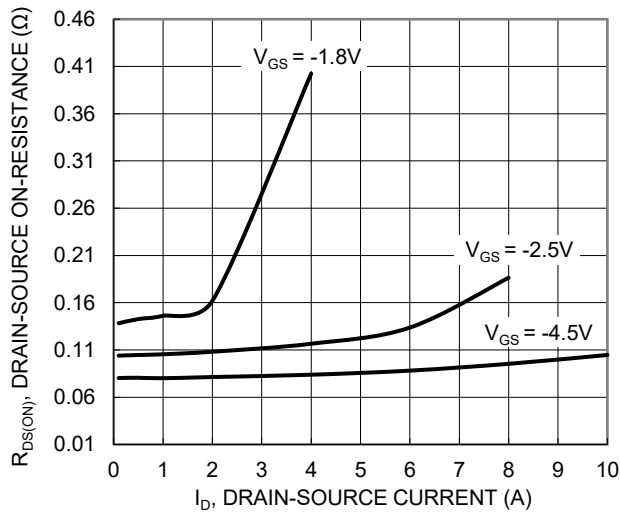


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

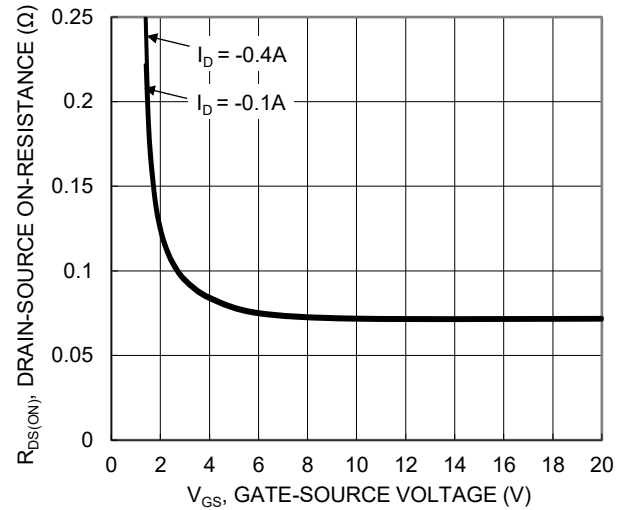


Figure 4. Typical Transfer Characteristic

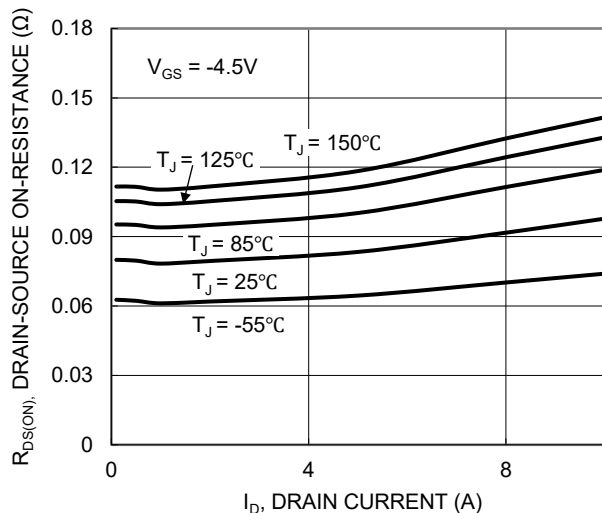


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

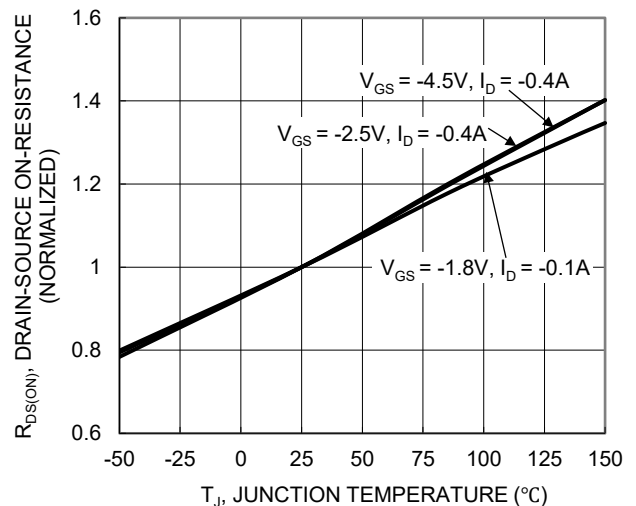


Figure 6. On-Resistance Variation with Junction Temperature

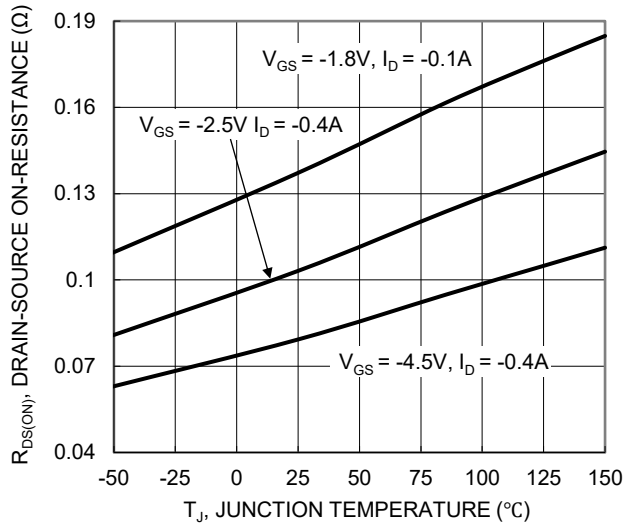


Figure 7. On-Resistance Variation with Junction Temperature

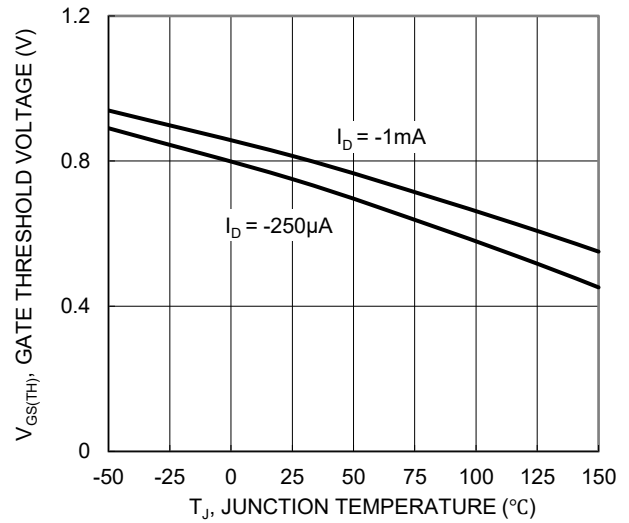


Figure 8. Gate Threshold Variation vs. Junction Temperature

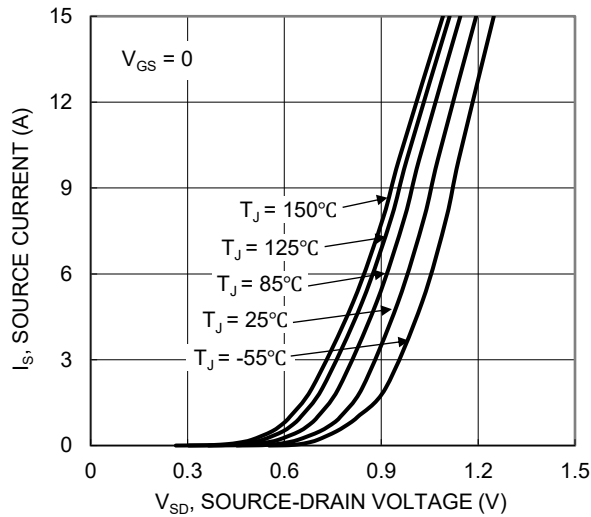


Figure 9. Diode Forward Voltage vs. Current

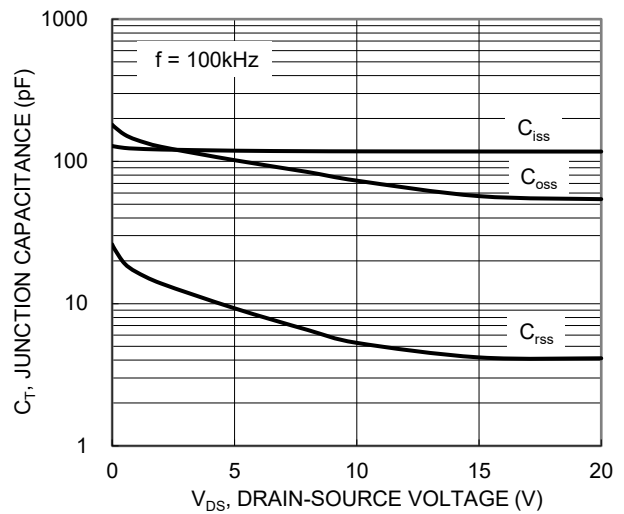


Figure 10. Typical Junction Capacitance

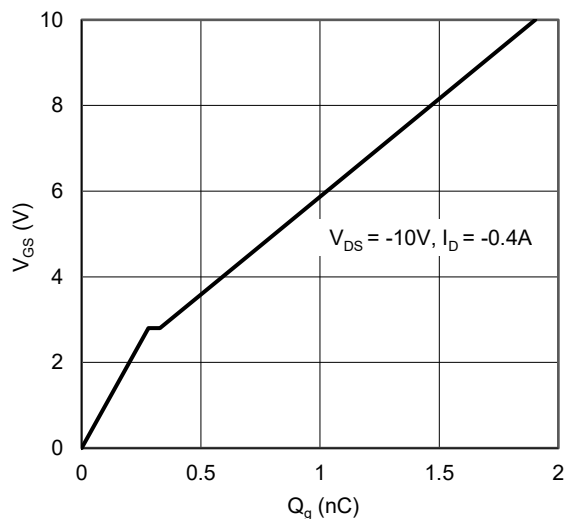


Figure 11. Gate Charge

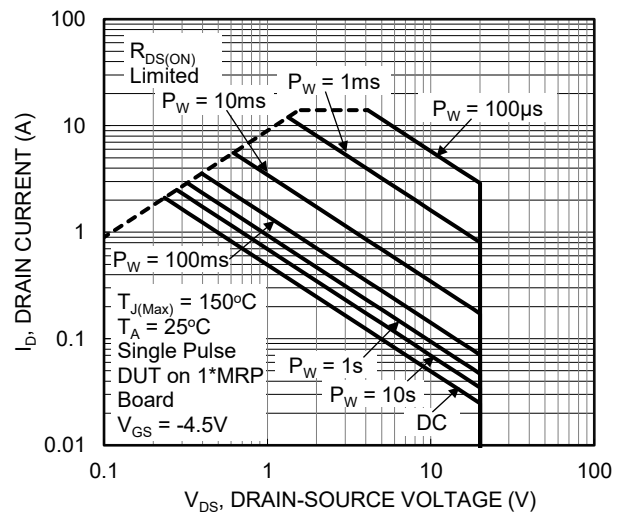


Figure 12. SOA, Safe Operation Area

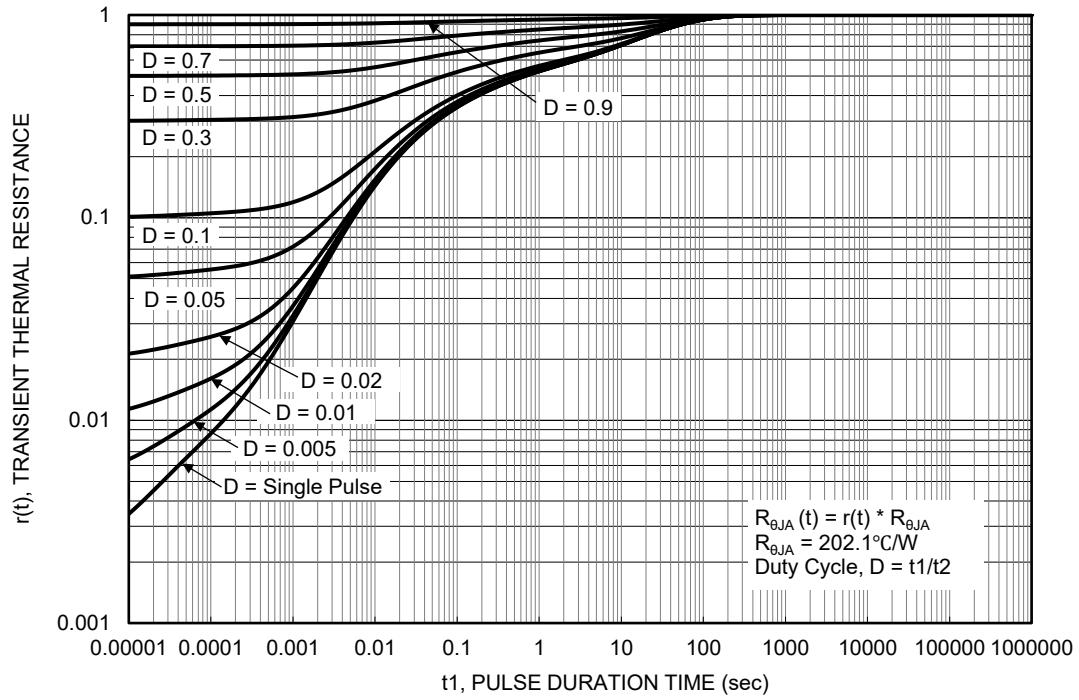
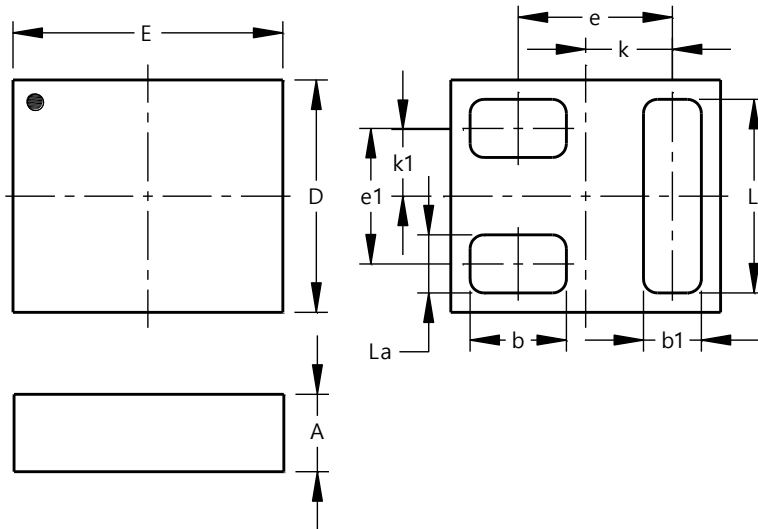


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X4-DSN0607-3

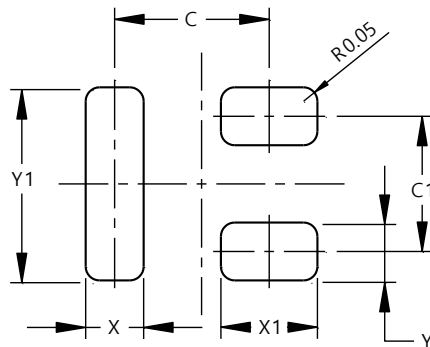


X4-DSN0607-3			
Dim	Min	Max	Typ
A	0.18	0.22	0.20
b	0.24	0.26	0.25
b1	0.14	0.16	0.15
D	0.56	0.64	0.60
E	0.65	0.73	0.69
e	--	--	0.40
e1	--	--	0.35
k	--	--	0.225
k1	--	--	0.175
L	0.49	0.51	0.50
La	0.14	0.16	0.15
All Dimensions in mm			

Suggested Pad Layout

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

X4-DSN0607-3

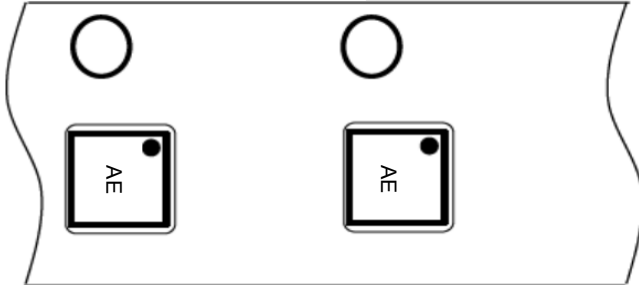


Dimensions	Value (in mm)
C	0.40
C1	0.35
X	0.15
X1	0.25
Y	0.15
Y1	0.50

Tape and Reel Information

Please see <https://www.diodes.com/assets/Packaging-Support-Docs/AP02007.pdf> for the latest version.

Pin 1 Orientation



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