

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
-100V	350mΩ @ V _{GS} = -10V	-1.6A
	450mΩ @ V _{GS} = -6.0V	-1.4A

Description

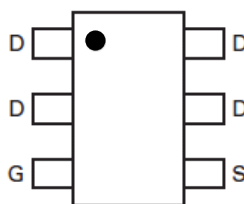
This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

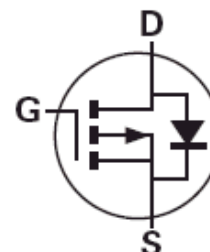
- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply



Top View



Pin Out - Top View



Equivalent Circuit

Features and Benefits

- Fast Switching Speed
- Low Gate Drive
- Low Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXMP10A17E6Q is suitable for automotive applications requiring specific change control and is AEC-Q101 qualified, is PPAP capable, and is manufactured in IATF16949:2016 certified facilities.**

Mechanical Data

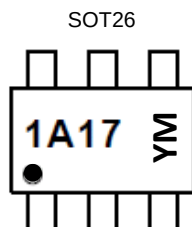
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.018 grams (Approximate)

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
ZXMP10A17E6QTA	Automotive	SOT26	3,000/Tape & Reel
ZXMP10A17E6QTAR	Automotive	SOT26	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. 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.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



1A17 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: G = 2019)
M = Month (ex: 9 = September)

Date Code Key

Year	2015	...	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	C	...	G	H	I	J	K	L	M	N	O

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-100	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current	V _{GS} = 10V	(Note 6)	I _D	-1.6	A
		T _A = +70°C (Note 6)		-1.3	
		(Note 5)		-1.3	
Pulsed Drain Current	V _{GS} = 10V	(Note 7)	I _{DM}	-7.7	A
Continuous Source Current (Body Diode)			I _S	-2.1	A
Pulsed Source Current (Body Diode)			I _{SM}	-7.7	A

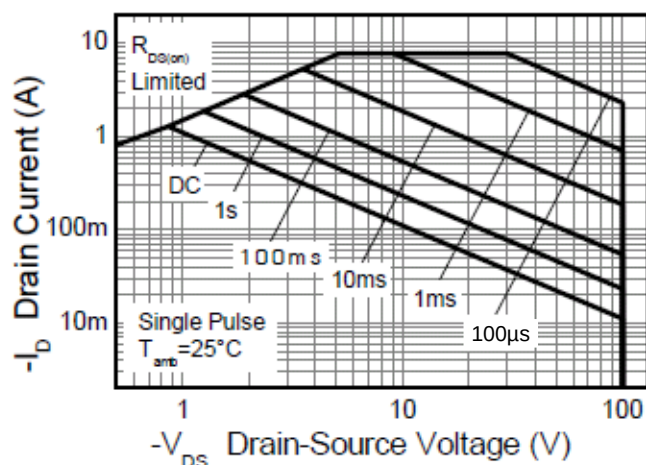
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P _D	1.1	W
	(Note 6)		8.8	
Linear Derating Factor	(Note 5)	R _{θJA}	1.7	mW/°C
	(Note 6)		13.7	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	113	°C/W
	(Note 6)		73	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

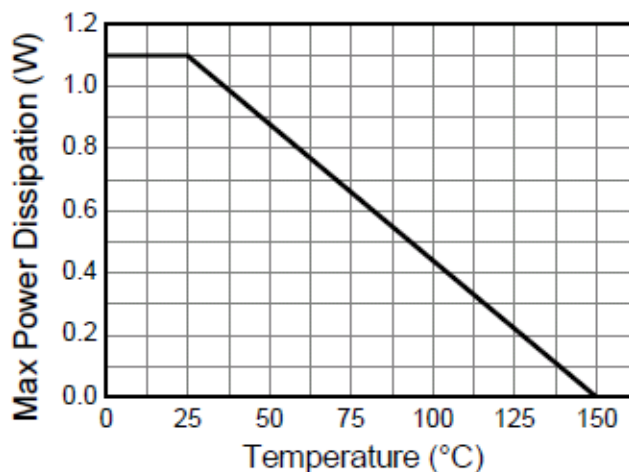
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-100	—	—	V	I _D = -250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-0.5	μA	V _{DS} = -100V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(TH)}	-2.0	—	-4.0	V	I _D = -250μA, V _{DS} = V _{GS}	
Static Drain-Source On-Resistance (Note 8)	R _{DS(ON)}	—	—	0.350	Ω	V _{GS} = -10V, I _D = -1.4A	
				0.450		V _{GS} = -6V, I _D = -1.2A	
Forward Transconductance (Notes 8 & 9)	g _{fs}	—	2.8	—	S	V _{DS} = -15V, I _D = -1.4A	
Diode Forward Voltage (Note 8)	V _{SD}	—	-0.85	-0.95	V	I _S = -1.7A, V _{GS} = 0V	
Reverse Recovery Time (Note 9)	t _{RR}	—	33	—	ns	I _S = -1.5A, di/dt = 100A/μs	
Reverse Recovery Charge (Note 9)	Q _{RR}	—	48	—	nC		
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	—	424	—	pF	V _{DS} = -50V, V _{GS} = 0V f = 1MHz	
Output Capacitance	C _{oss}	—	36.6	—	pF		
Reverse Transfer Capacitance	C _{rss}	—	29.8	—	pF		
Total Gate Charge (Note 10)	Q _g	—	7.1	—	nC	V _{GS} = -6V	V _{DS} = -50V I _D = -1.4A
Total Gate Charge (Note 10)	Q _g	—	10.7	—	nC	V _{GS} = -10V	
Gate-Source Charge (Note 10)	Q _{gs}	—	1.7	—	nC		
Gate-Drain Charge (Note 10)	Q _{gd}	—	3.8	—	nC		
Turn-On Delay Time (Note 10)	t _{D(ON)}	—	3	—	ns	V _{DD} = -50V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω	
Turn-On Rise Time (Note 10)	t _R	—	3.5	—	ns		
Turn-Off Delay Time (Note 10)	t _{D(OFF)}	—	13.4	—	ns		
Turn-Off Fall Time (Note 10)	t _F	—	7.2	—	ns		

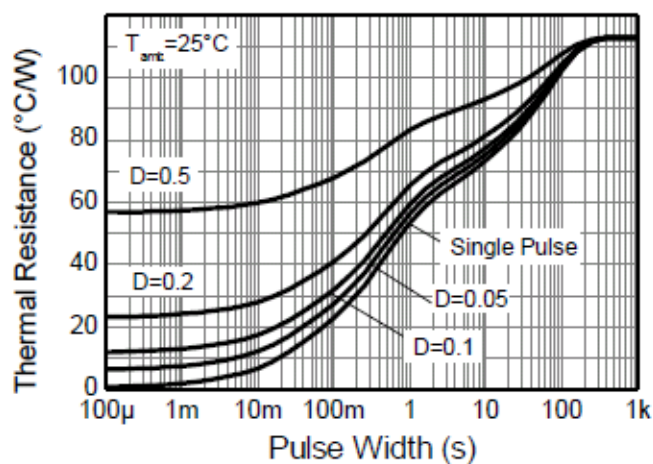
- Notes:
- For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as Note 5, except the device is measured at t ≤ 5 sec.
 - Same as Note 5, except the device is pulsed with D = 0.05 and pulse width 10μs. The pulse current is limited by the maximum junction temperature.
 - Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 - For design aid only, not subject to production testing.
 - Switching characteristics are independent of operating junction temperatures.



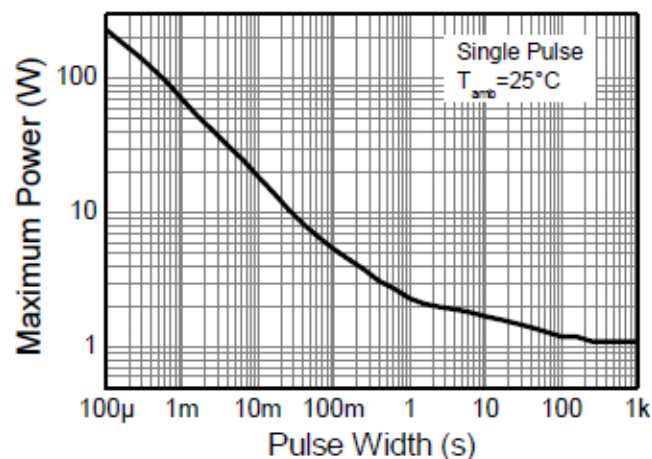
Safe Operating Area



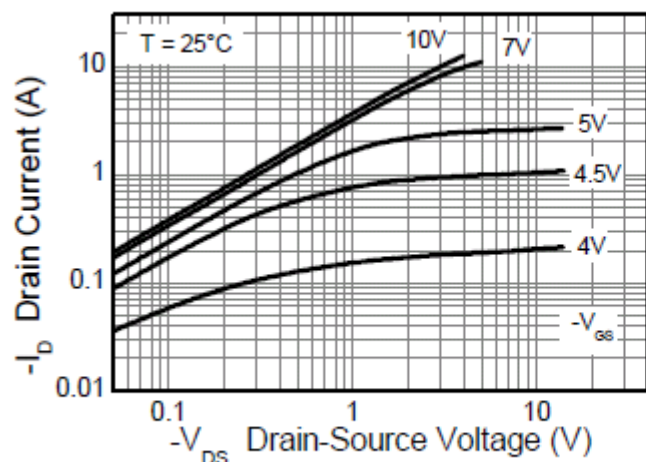
Derating Curve



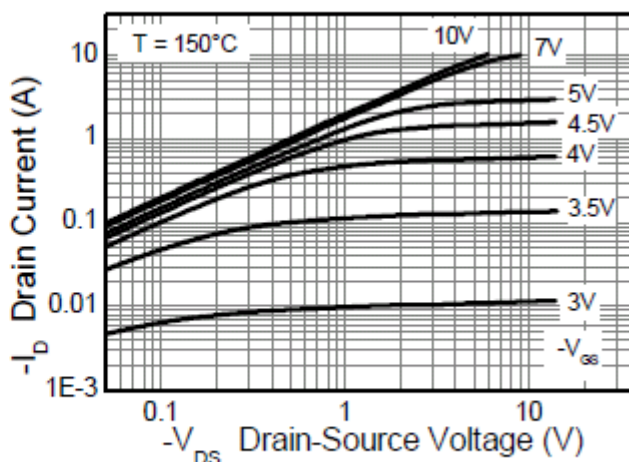
Transient Thermal Impedance



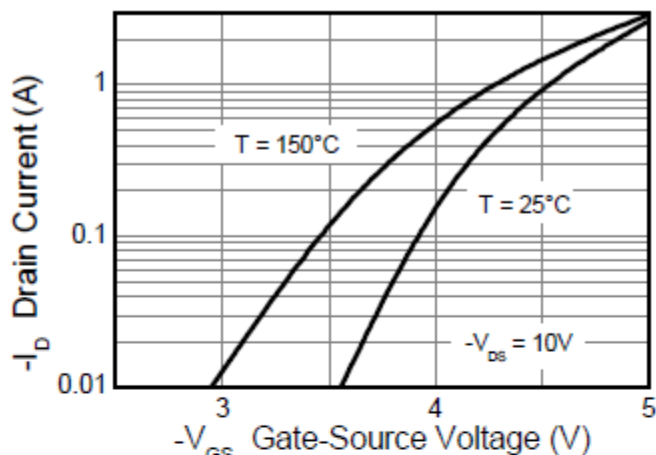
Pulse Power Dissipation



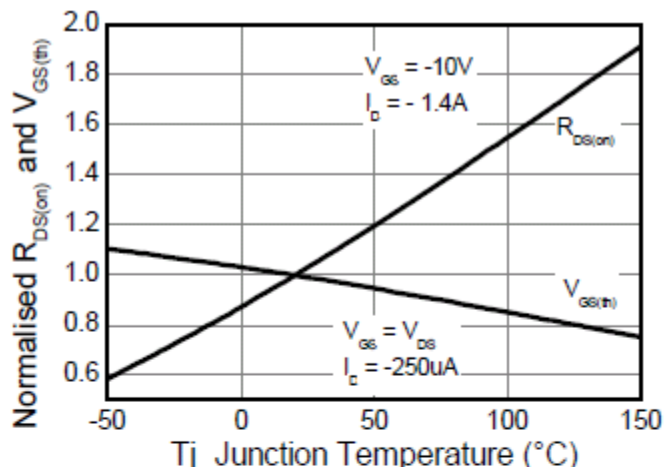
Output Characteristics



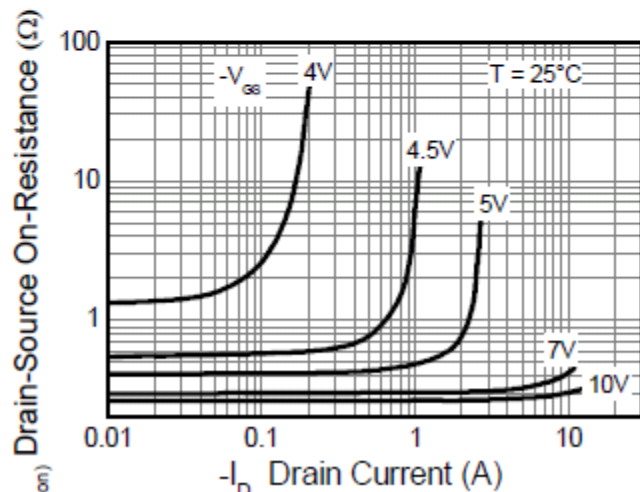
Output Characteristics



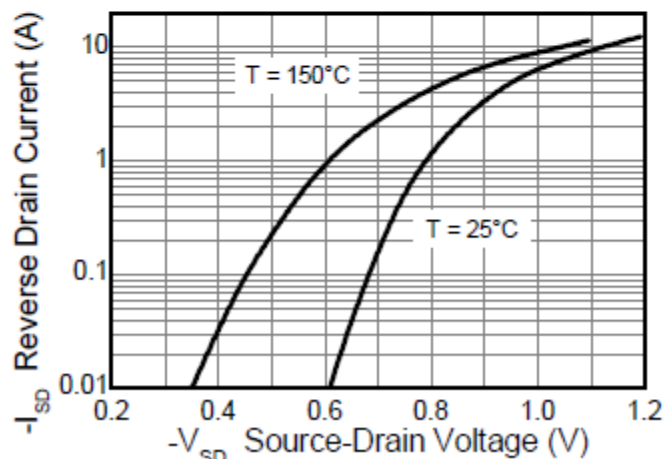
Typical Transfer Characteristics



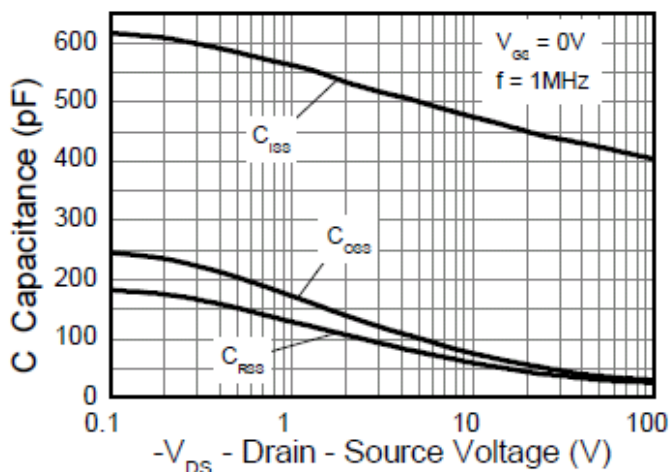
Normalised Curves v Temperature



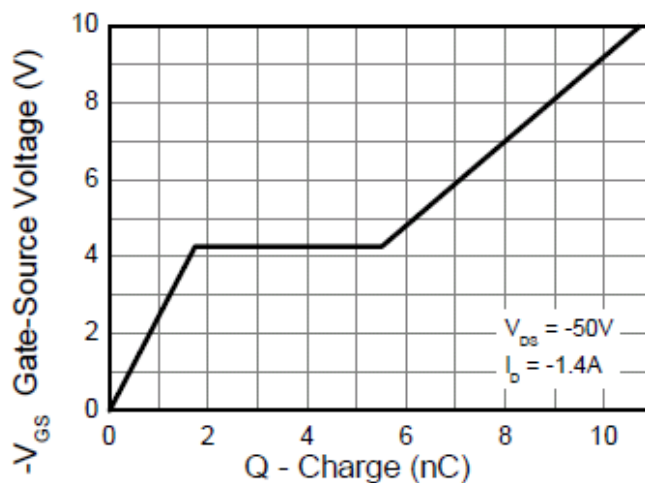
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

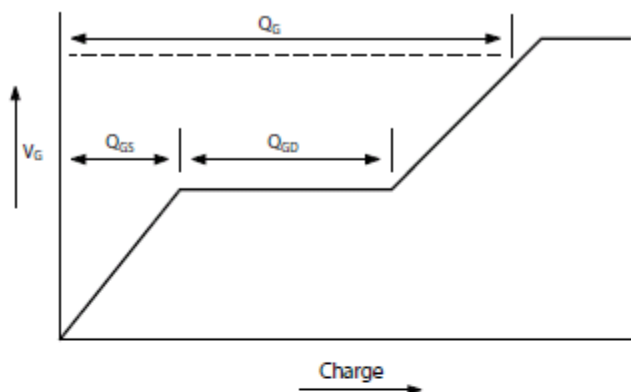


Capacitance v Drain-Source Voltage

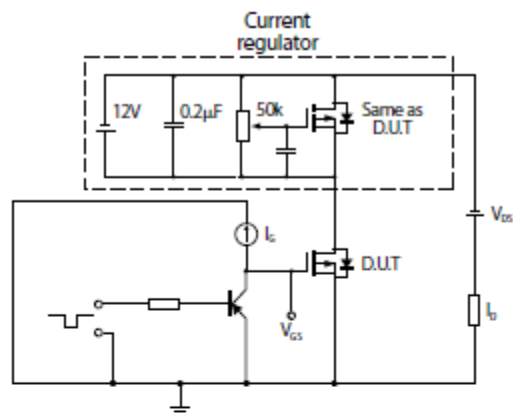


Gate-Source Voltage v Gate Charge

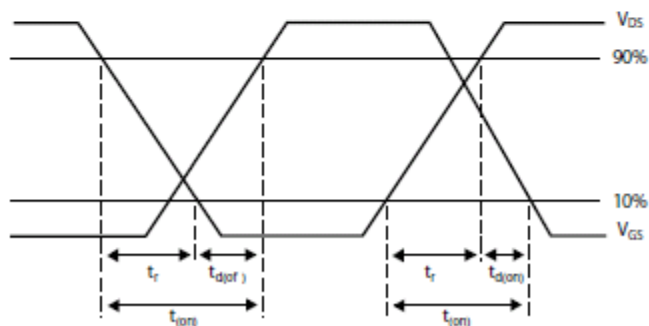
Test Circuits



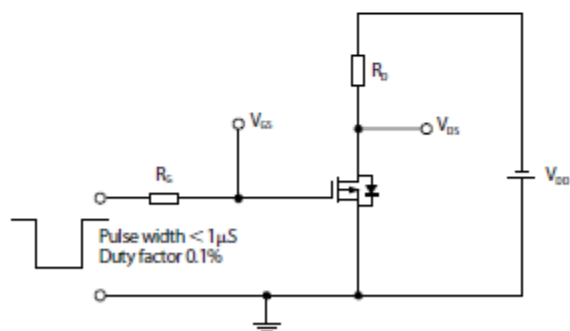
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

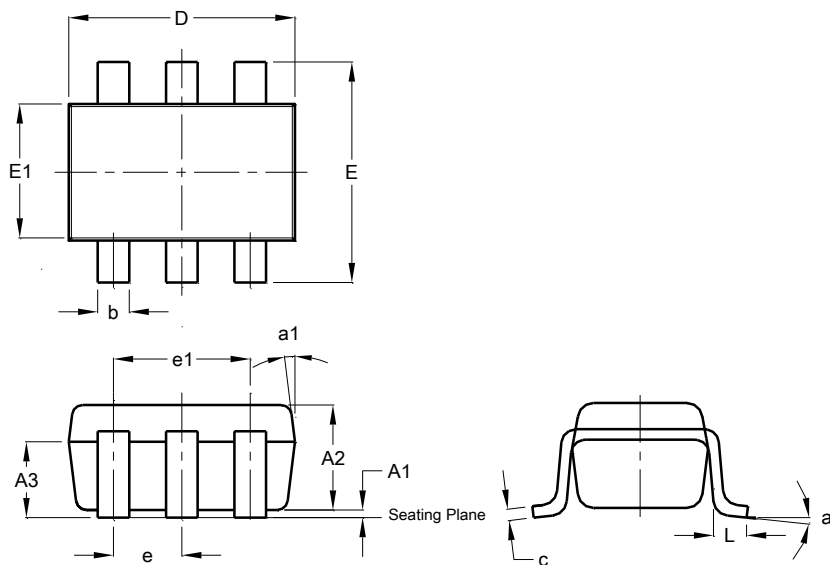


Switching time test circuit

Package Outline Dimensions

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

SOT26

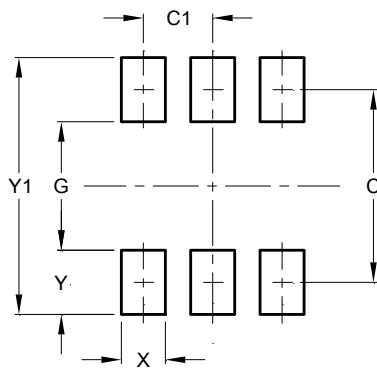


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

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

SOT26

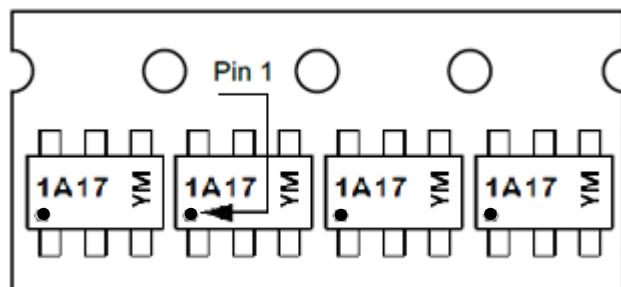


Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

Tape and Reel Information

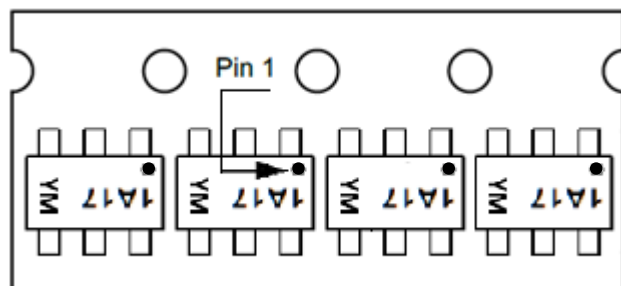
Please see <https://www.diodes.com/assets/Packaging-Support-Docs/Ap02007.pdf> for the latest version.

ZXMP10A17E6QTA



ZXMP10A17E6QTAR

Rotate 180 degree of Pin 1 orientation in the carrier tape.



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