

## Product Summary

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = +25^\circ C$
-20V	200m $\Omega$ @ $V_{GS} = -4.5V$	-2.3A

## Description

This new generation of high density MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

## Applications

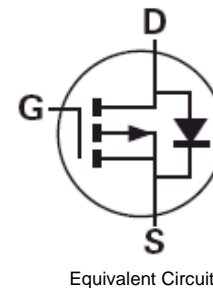
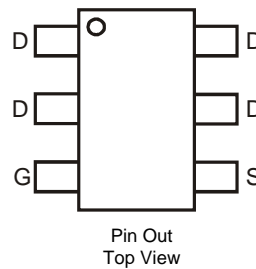
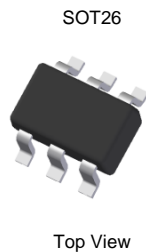
- DC - DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

## Features and Benefits

- Low On-resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## 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  $\text{e3}$
- Weight: 0.018 grams (Approximate)

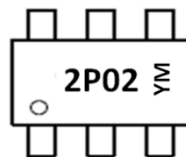


## Ordering Information (Note 4)

Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXM62P02E6TA	7	8	3,000
ZXM62P02E6TC	13	8	10,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

## Marking Information



2P02 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: C = 2015)  
 M or  $\bar{M}$  = Month (ex: 9 = September)

### Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	C	D	E	F	G	H	I	J	K	L	M	N

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

## Absolute Maximum Ratings

Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		$V_{DSS}$	-20	V	
Gate-Source Voltage		$V_{GSS}$	$\pm 12$	V	
Continuous Drain Current	$V_{GS} = -4.5V$	$I_D$	$T_A = +25^\circ C$ (Note 6)	-2.3	A
			$T_A = +70^\circ C$ (Note 6)	-1.7	
Pulsed Drain Current		(Note 7)	$I_{DM}$	-13	A
Continuous Source Current (Body Diode)		(Note 6)	$I_S$	-1.9	A
Pulsed Source Current (Body Diode)		(Note 7)	$I_{SM}$	-13	A
Power Dissipation at $T_A = +25^\circ C$		(Note 5)	$P_D$	1.1	W
Linear Derating Factor				8.8	
Power Dissipation at $T_A = +25^\circ C$		(Note 6)	$P_D$	1.7	W
Linear Derating Factor				13.7	
Operating and Storage Temperature Range			$T_J, T_{STG}$	-55 to +150	$^\circ C$

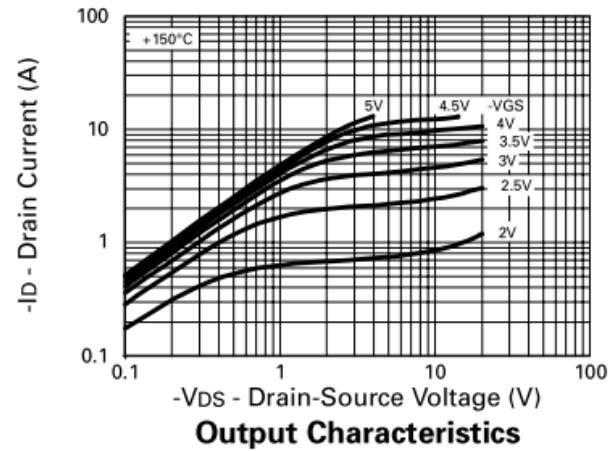
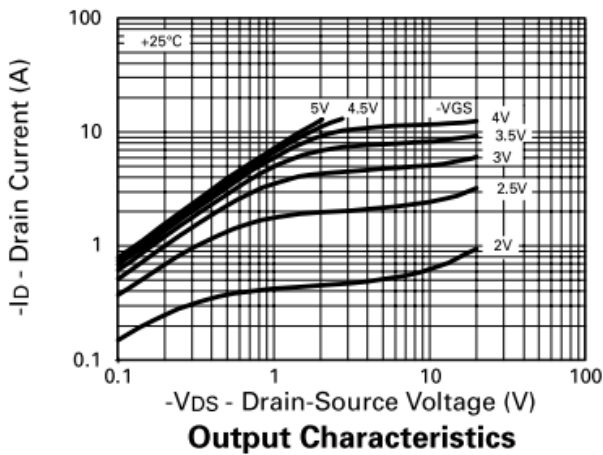
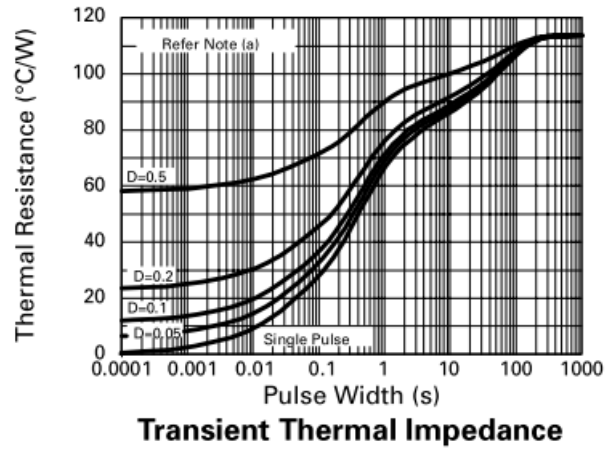
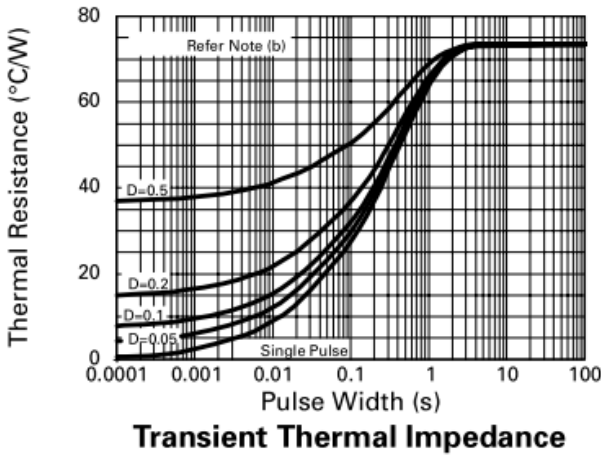
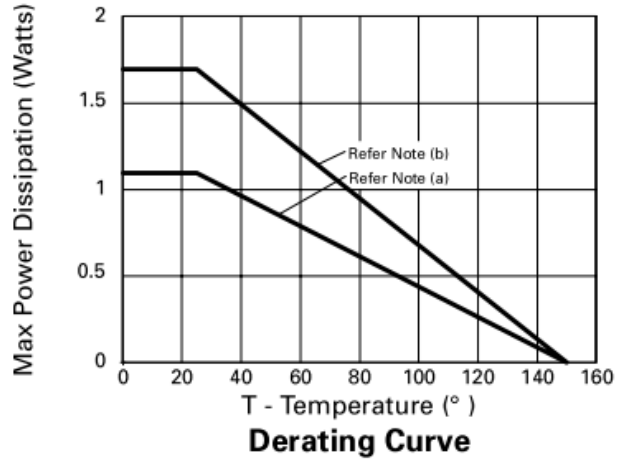
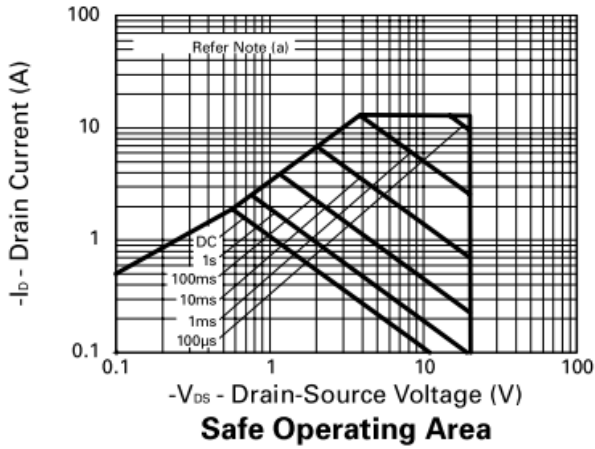
## Thermal Resistance

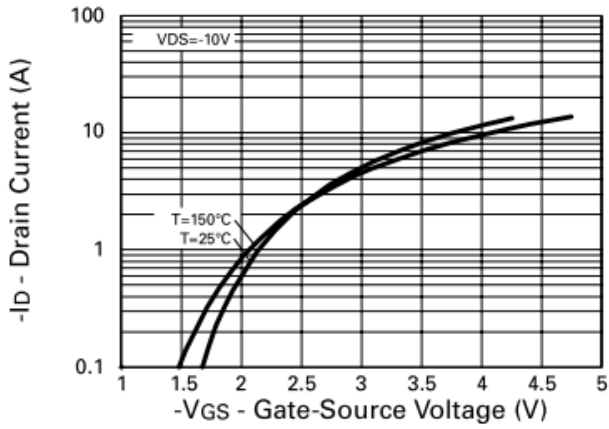
Characteristic		Symbol	Value	Unit
Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	$^\circ C/W$
	(Note 6)		73	

## Electrical Characteristics (@ $T_A = +25^\circ C$ , unless otherwise stated.)

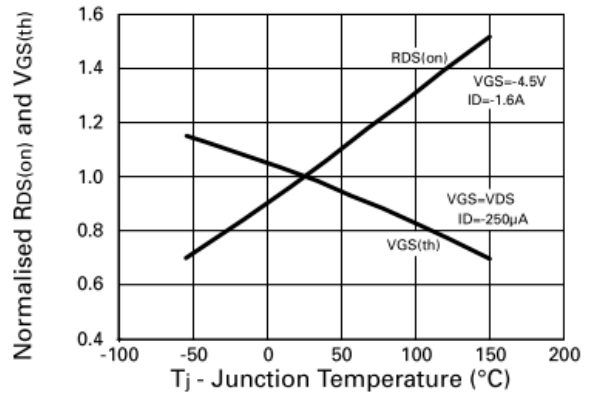
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-20	—	—	V	$I_D = -250\mu A, V_{GS} = 0V$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu A$	$V_{DS} = -20V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
Gate Threshold Voltage	$V_{GS(TH)}$	-0.7	—	—	V	$I_D = -250\mu A, V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	—	0.2	$\Omega$	$V_{GS} = -4.5V, I_D = -1.6A$
				0.375		$V_{GS} = -2.7V, I_D = -0.8A$
Forward Transconductance (Note 10)	$g_{fs}$	1.5	—	—	S	$V_{DS} = -10V, I_D = -0.8A$
<b>DYNAMIC (Note 10)</b>						
Input Capacitance	$C_{iss}$	—	320	—	pF	$V_{DS} = -15V, V_{GS} = 0V$ $f = 1MHz$
Output Capacitance	$C_{oss}$	—	150	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	75	—	pF	
<b>SWITCHING (Notes 9 and 10)</b>						
Total Gate Charge	$Q_g$	—	—	5.8	nC	$V_{DS} = -16V, V_{GS} = -4.5V$ $I_D = -1.6A$ (Refer to test circuit)
Gate-Source Charge	$Q_{gs}$	—	—	1.25	nC	
Gate-Drain Charge	$Q_{gd}$	—	—	2.8	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.1	—	ns	$V_{DD} = -10V, I_D = -1.6A, R_G = 6\Omega,$ $R_D = 6.1\Omega$ (Refer to test circuit)
Turn-On Rise Time	$t_R$	—	15.4	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	12.0	—	ns	
Turn-Off Fall Time	$t_F$	—	19.2	—	ns	
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (Note 8)	$V_{SD}$	—	—	-0.95	V	$T_J = +25^\circ C, I_S = -1.6A,$ $V_{GS} = 0V$
Reverse recovery time (Note 10)	$t_{RR}$	—	22.5	—	ns	$T_J = +25^\circ C, I_F = -1.6A,$
Reverse recovery charge (Note 10)	$Q_{RR}$	—	10.4	—	nC	$di/dt = 100A/\mu s$

- 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.
  - For a device surface mounted on FR-4 PCB measured at  $t \leq 5$  secs.
  - Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
  - Measured under pulsed conditions. Width= 300 $\mu s$ ; duty cycle  $\leq 2\%$ .
  - Switching characteristics are independent of operating junction temperatures.
  - For design aid only, not subject to production testing.

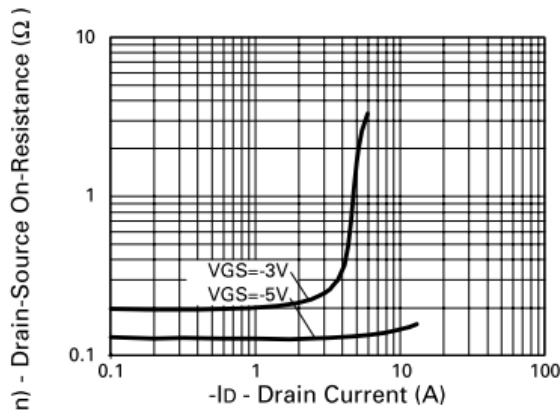




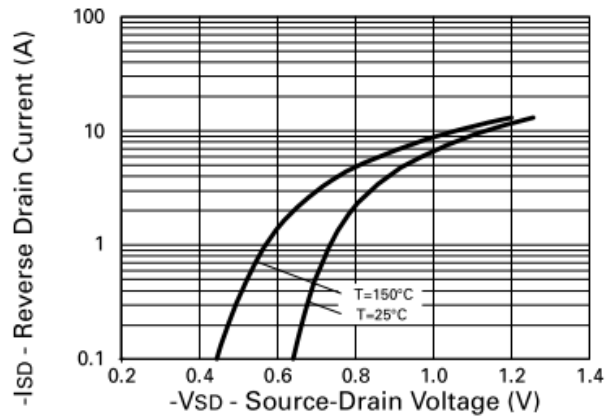
**Typical Transfer Characteristics**



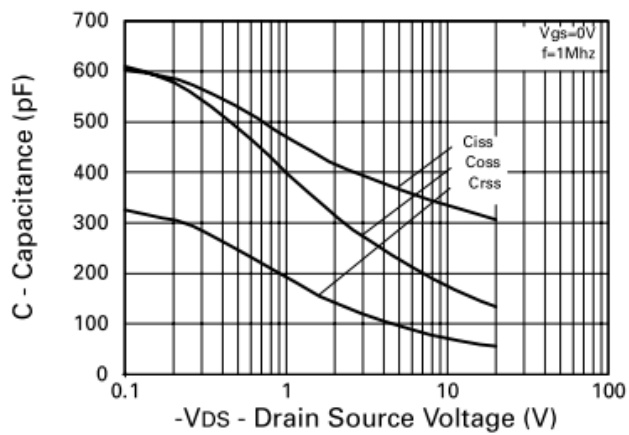
**Normalised RDS(on) and VGS(th) v Temperature**



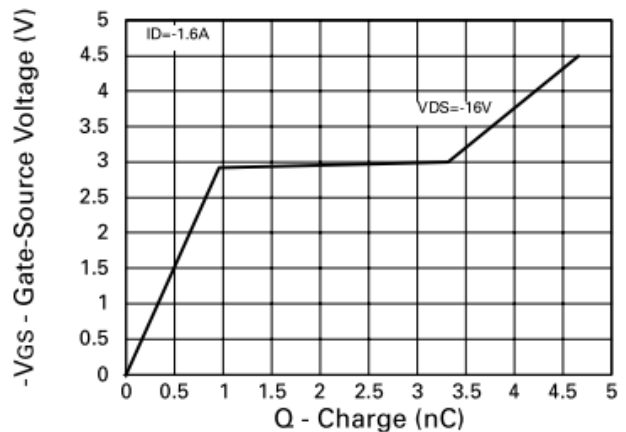
**On-Resistance v Drain Current**



**Source-Drain Diode Forward Voltage**

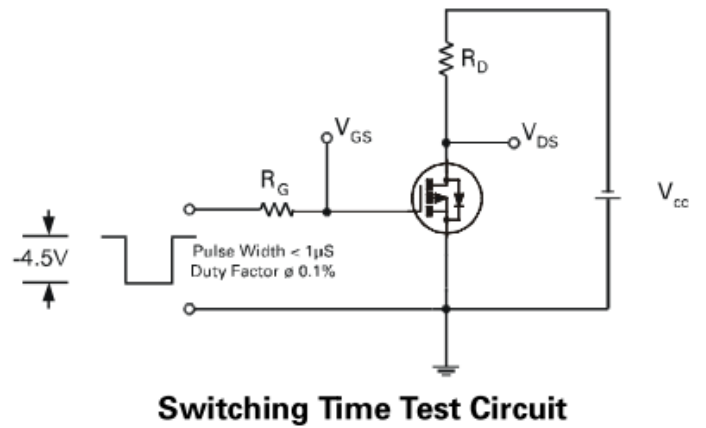
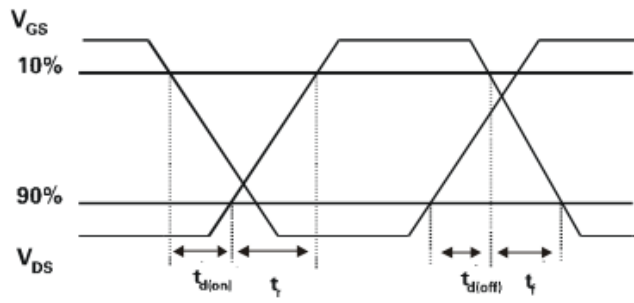
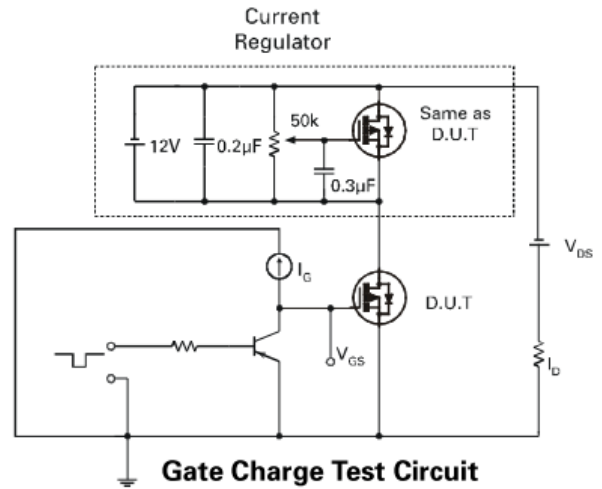
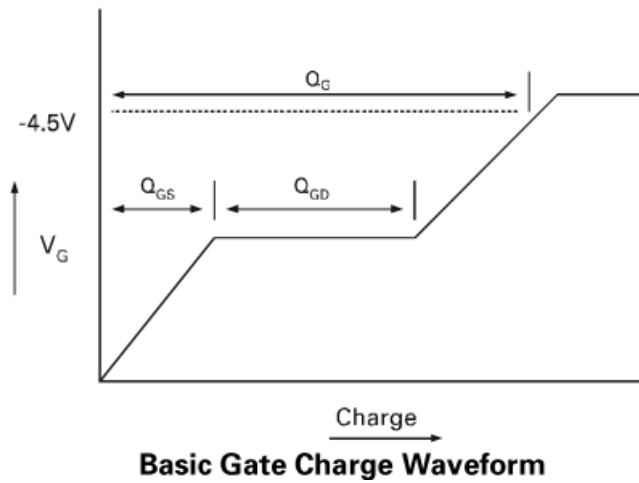


**Capacitance v Drain-Source Voltage**



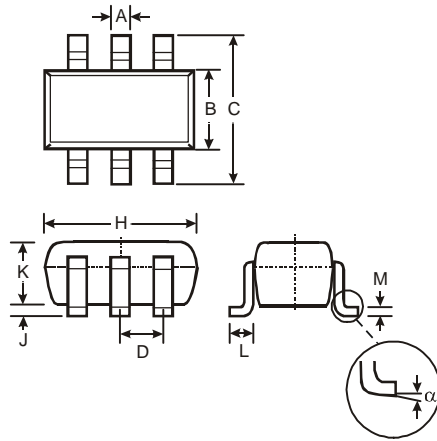
**Gate-Source Voltage v Gate Charge**

**Test Circuits**



**Package Outline Dimensions**

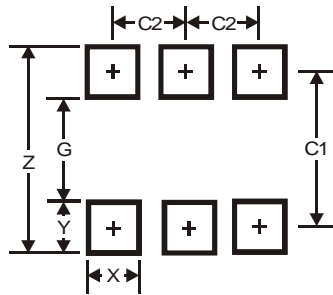
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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