

Product Summary

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

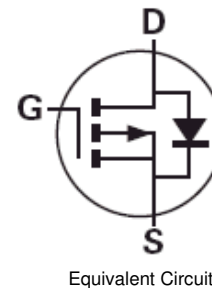
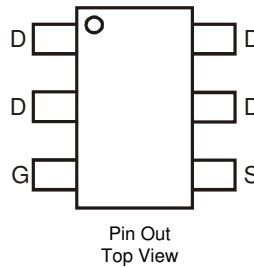
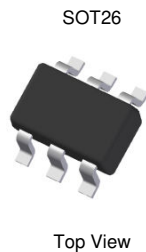
- DC - DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

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
- Weight: 0.018 grams (Approximate)

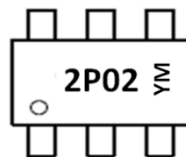


Ordering Information (Note 4)

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 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}	± 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	$^\circ C$	

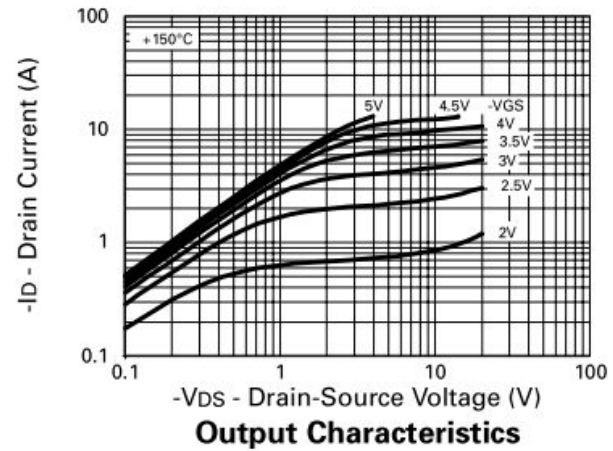
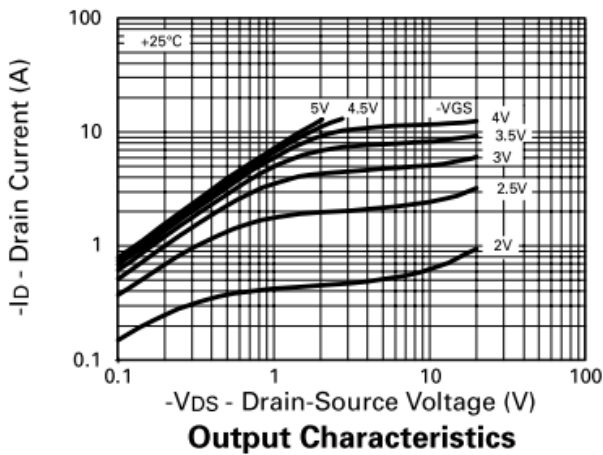
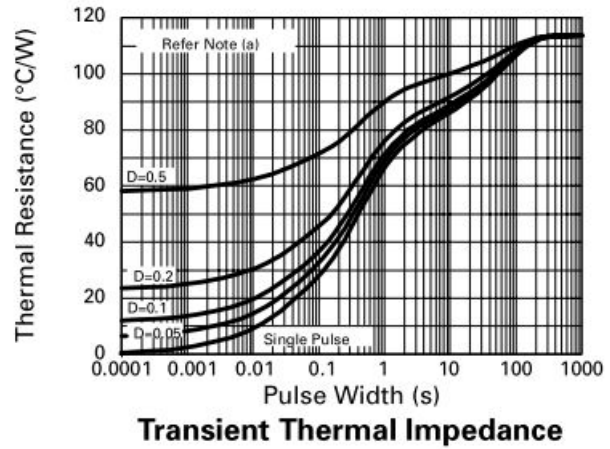
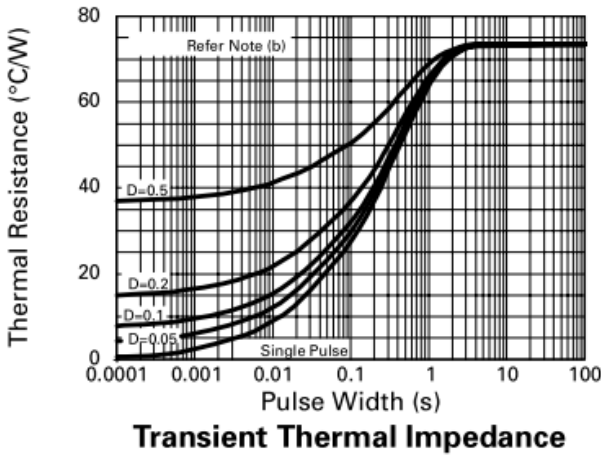
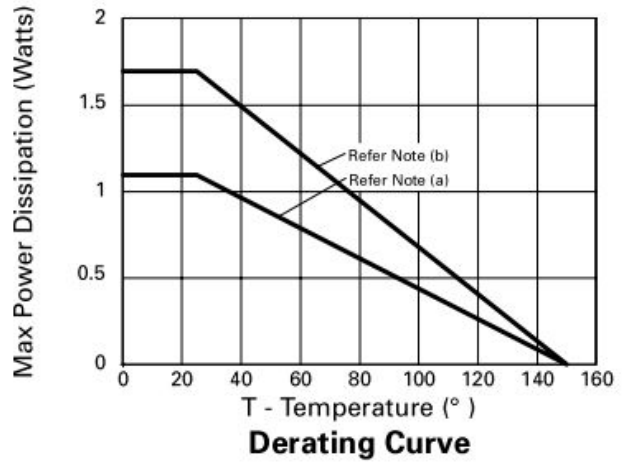
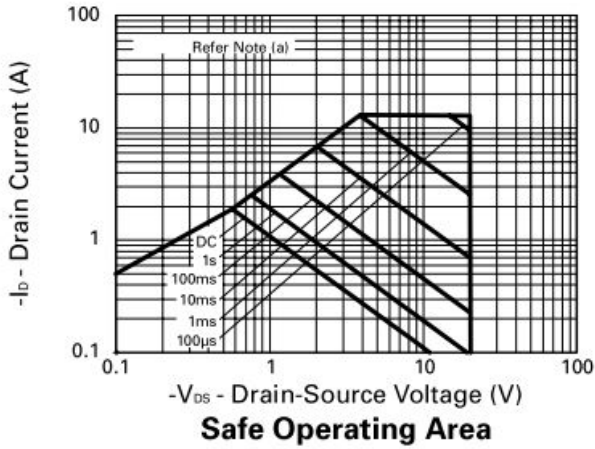
Thermal Resistance

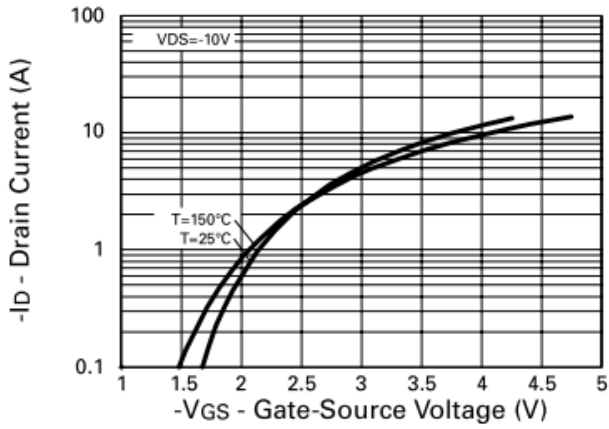
Characteristic		Symbol	Value	Unit
Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	$^\circ C/W$
	(Note 6)		73	

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

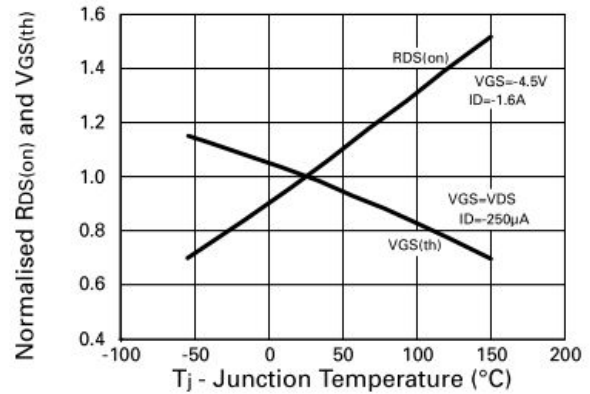
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	$I_D = -250\mu A, V_{GS} = 0V$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$V_{DS} = -20V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
Gate 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	Ω	$V_{GS} = -4.5V, I_D = -1.6A$
				0.375		$V_{GS} = -2.7V, I_D = -0.8A$
Forward Transconductance (Note 10)	g_{fs}	1.5	—	—	S	$V_{DS} = -10V, I_D = -0.8A$
DYNAMIC (Note 10)						
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	
SWITCHING (Notes 9 and 10)						
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	
SOURCE-DRAIN DIODE						
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:
5. For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 6. For a device surface mounted on FR-4 PCB measured at $t \leq 5$ secs.
 7. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
 8. Measured under pulsed conditions. Width= 300 μs ; duty cycle $\leq 2\%$.
 9. Switching characteristics are independent of operating junction temperatures.
 10. For design aid only, not subject to production testing.

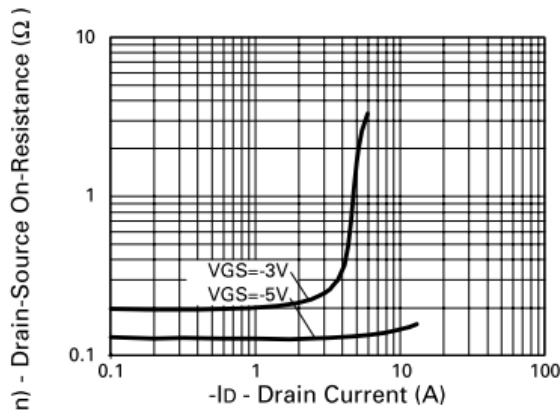




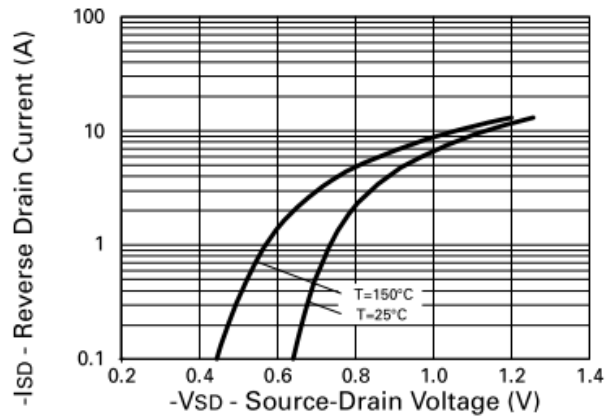
Typical Transfer Characteristics



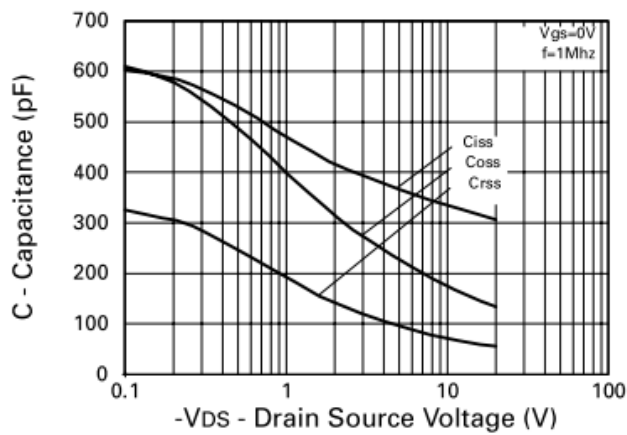
Normalised RDS(on) and VGS(th) v Temperature



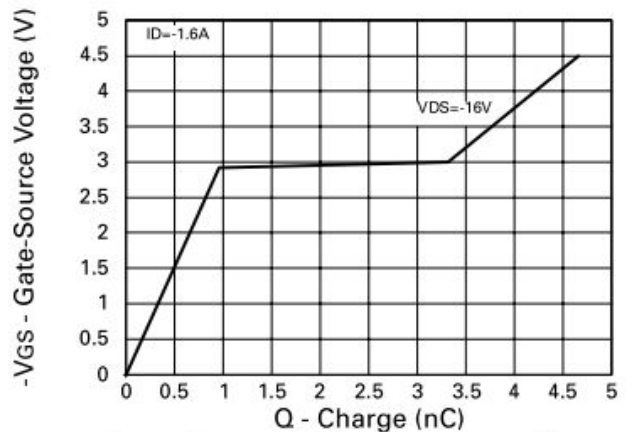
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

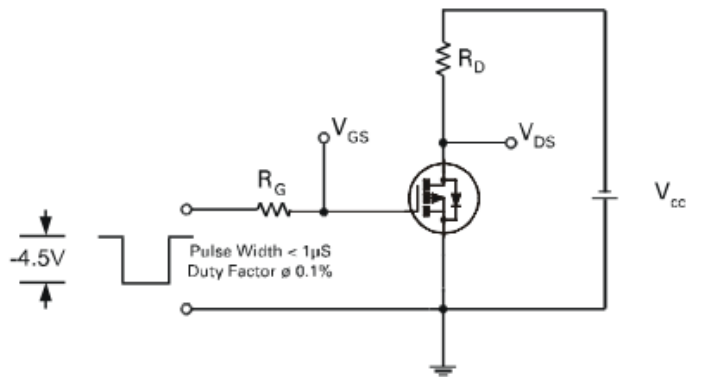
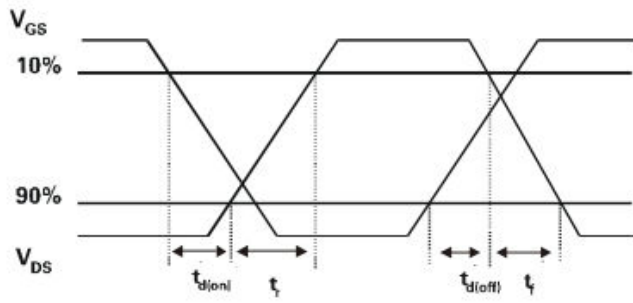
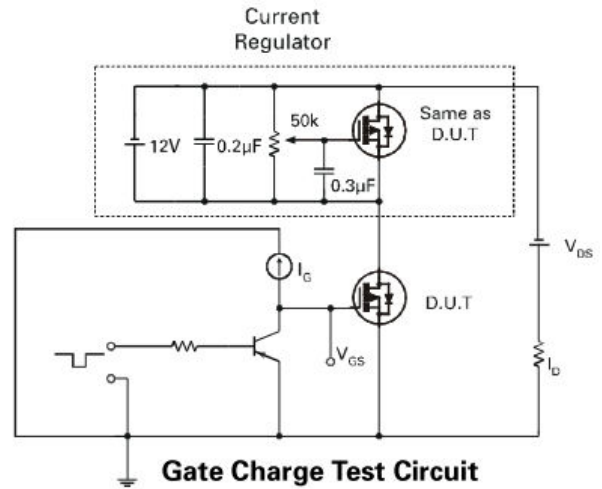
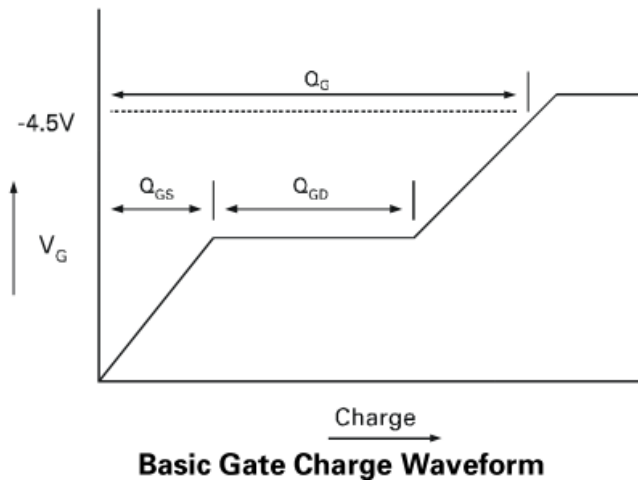


Capacitance v Drain-Source Voltage



Gate-Source Voltage v Gate Charge

Test Circuits

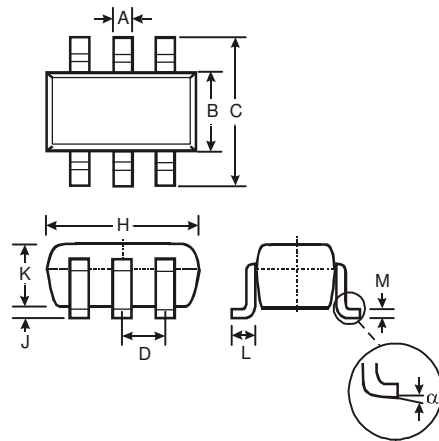


Switching Time Waveforms

Switching Time Test Circuit

Package Outline Dimensions

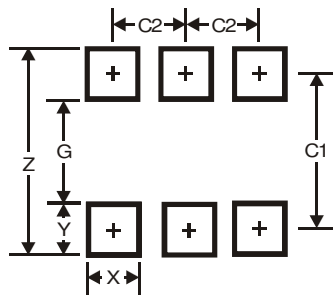
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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