20V SOT26 N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	Max $R_{DS(ON)}$	Max I_D T_A = +25°C
20V	0.040Ω @ V_{GS} = 4.5V	5.4A
	0.055Ω @ V_{GS} = 2.5V	4.6A
	0.075Ω @ V_{GS} = 1.8V	4.0A

Features and Benefits

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

Description and Applications

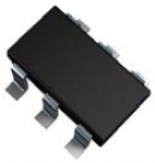
This new generation trench MOSFET from Zetex features low on-resistance achievable with low gate drive.

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

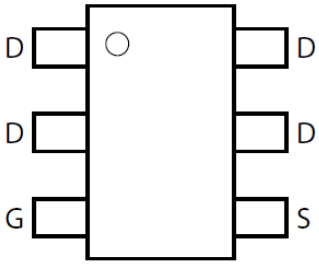
Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.015 grams (Approximate)

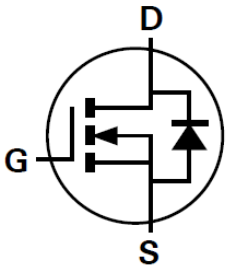
SOT26



Top View



Pinout Top-view



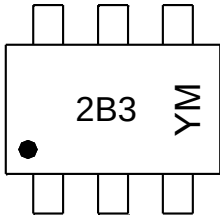
Device Symbol

Ordering Information (Note 4)

Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXMN2B03E6TA	7	8	3000

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



2B3 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: C = 2015)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

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

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.)

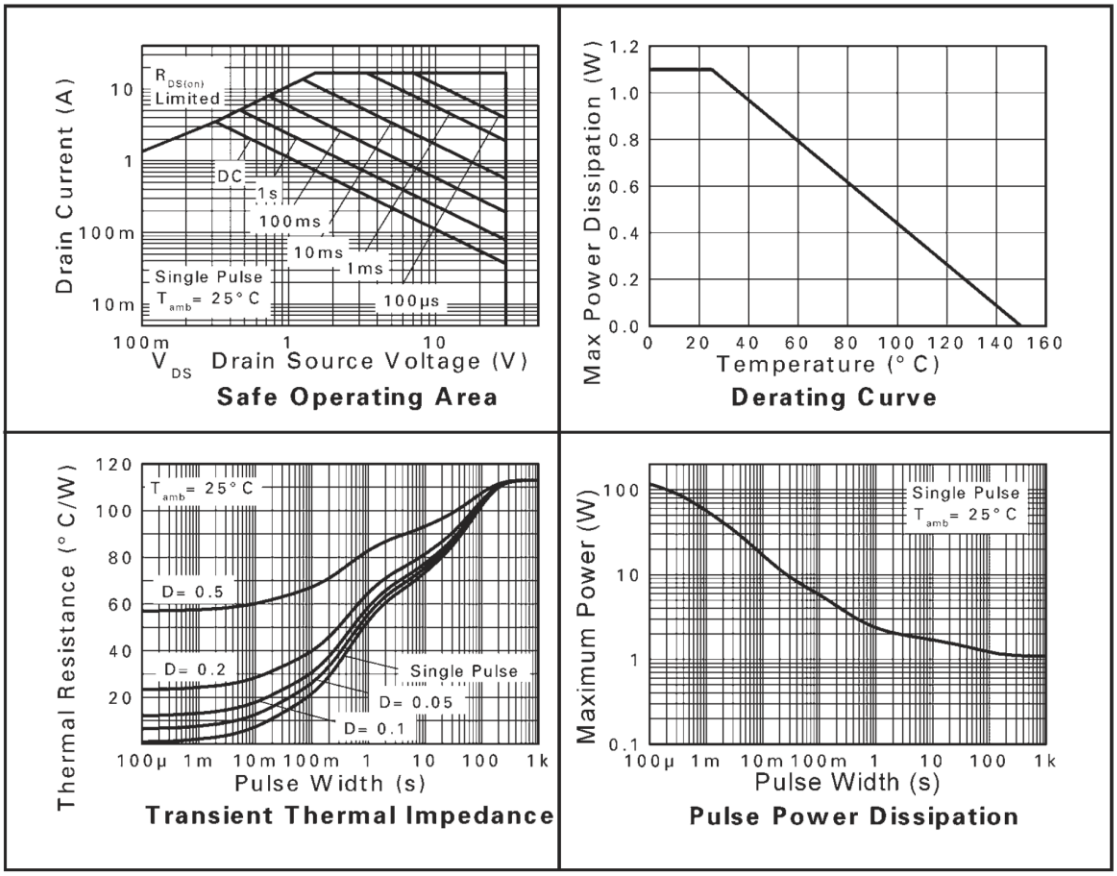
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GS}	±8	V
Continuous Drain Current	V_{GS} = 4.5V	T_A = +25°C (Note 6)	I_D	5.4	A
		T_A = +70°C (Note 6)		4.3	
		T_A = +25°C (Note 5)		4.3	
Pulsed Drain Current (Note 7)			I_{DM}	26	A
Continuous Source Current (Body Diode) (Note 6)			I_S	2.8	A
Pulsed Source Current (Body Diode) (Note 7)			I_{SM}	26	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation at T_A = +25°C (Note 5) Linear derating factor (Note 5)	P_D	1.1 8.8	W mW/°C
Power Dissipation at T_A = +25°C (Note 6) Linear derating factor (Note 6)	P_D	1.7 13.7	W mW/°C
Junction to Ambient (Note 5)	$R_{\theta JA}$	113	°C/W
Junction to Ambient (Note 6)	$R_{\theta JA}$	73	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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≦10 secs.
7. Repetitive rating 25mm x 25mm FR-4 PCB, D = 0.02, pulse width 300µs - pulse width limited by maximum junction temperature.

Thermal Characteristics

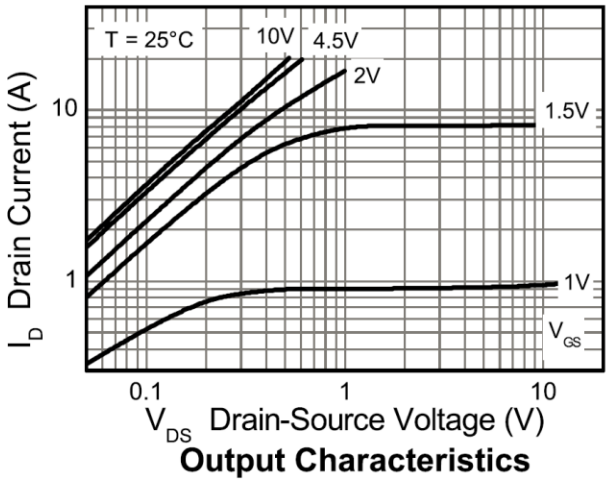


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

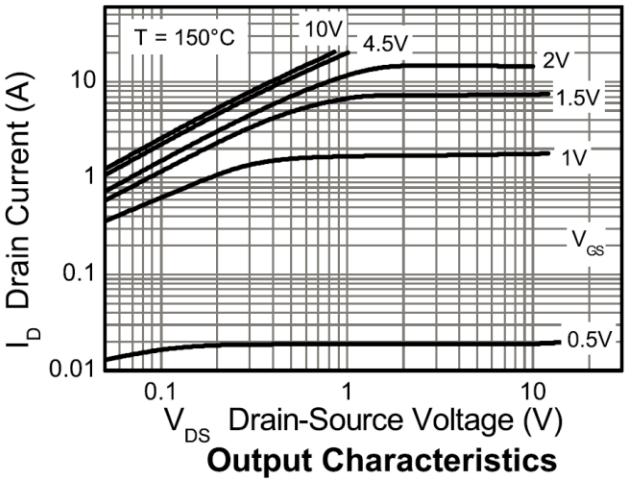
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-source Breakdown Voltage	BV_{DSS}	20	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 20V, V_{GS} = 0V
Gate-body Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±8V, V_{DS} = 0V
Diode Forward Voltage (Note 8)	V_{SD}	—	0.67	0.95	V	T_J = +25°C , I_S = 1.8A, V_{GS} = 0V
ON CHARACTERISTICS						
Gate-source Threshold Voltage	$V_{GS(th)}$	0.4	—	1.0	V	I_D = 250μA, V_{DS} = V_{GS}
Static Drain-source On-state Resistance (Note 8)	$R_{DS(ON)}$	—	—	0.040	Ω	V_{GS} = 4.5V, I_D = 4.3A
				0.055		V_{GS} = 2.5V, I_D = 3.7A
				0.075		V_{GS} = 1.8V, I_D = 3.2A
Forward Transconductance (Notes 8 & 10)	g_{fs}	—	13.5	—	S	V_{DS} = 10V, I_D = 4.3A
DYNAMIC CHARACTERISTICS (Notes 9 & 10)						
Input Capacitance	C_{iss}	—	1160	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	210	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	136	—	pF	
Total Gate Charge	Q_g	—	14.5	—	nC	V_{GS} = 4.5V, V_{DS} = 10V I_D = 4.3A
Gate-source Charge	Q_{gs}	—	2.0	—	nC	
Gate-drain Charge	Q_{gd}	—	2.8	—	nC	
Reverse Recovery Time (Note 10)	t_{rr}	—	10.8	—	ns	T_J = +25°C, I_F=2.8A, di/dt= 100A/μs
Reverse Recovery Charge (Note 10)	Q_{rr}	—	3.4	—	nC	
Turn-on Delay Time	$t_{d(on)}$	—	2.9	—	ns	V_{DD} = 10V, V_{GS} = 4.5V I_D = 1A, R_G = 6.0Ω
Turn-on Rise Time	t_r	—	6.4	—	ns	
Turn-off Delay Time	$t_{d(off)}$	—	16.0	—	ns	
Turn-off Fall Time	t_f	—	11.2	—	ns	

Notes: 8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.
9. Switching characteristics are independent of operating junction temperature.
10. For design aid only, not subject to production testing.

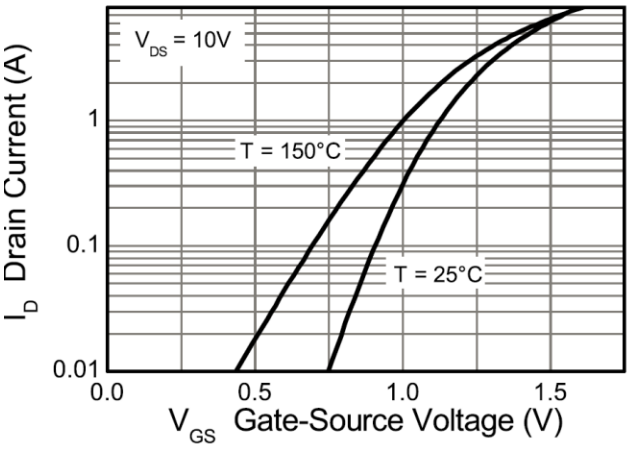
Typical Characteristics



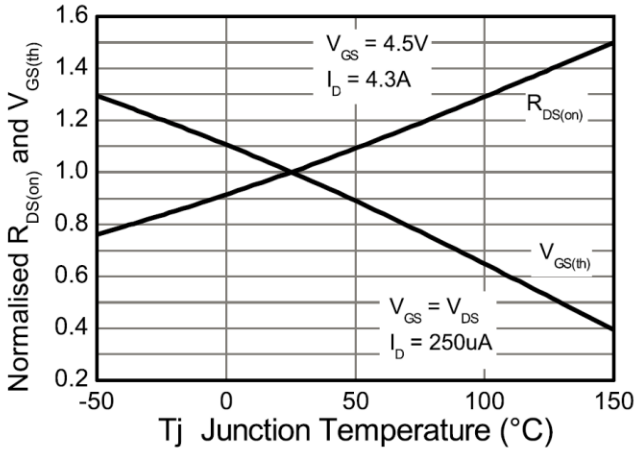
Output Characteristics



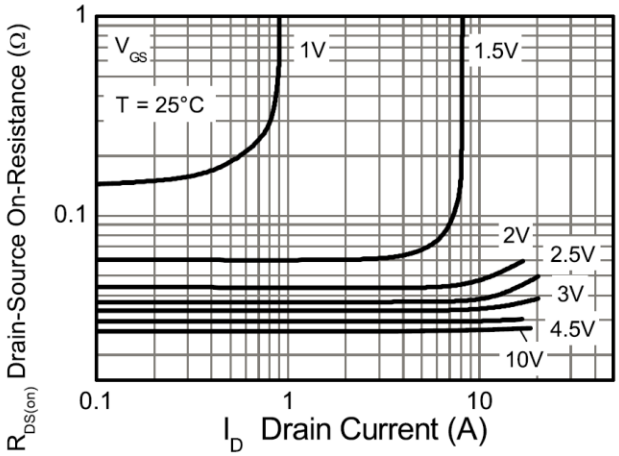
Output Characteristics



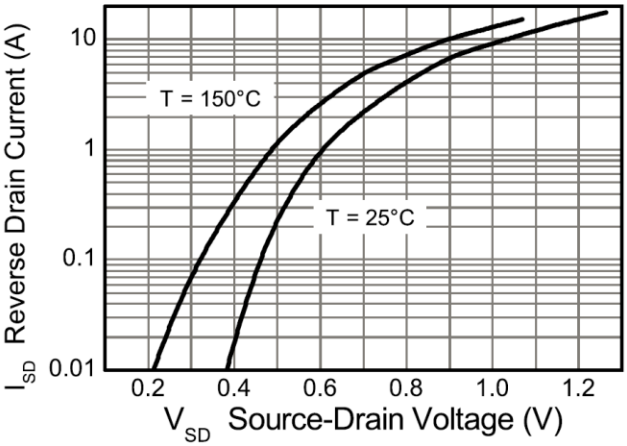
Typical Transfer Characteristics



Normalised Curves v Temperature

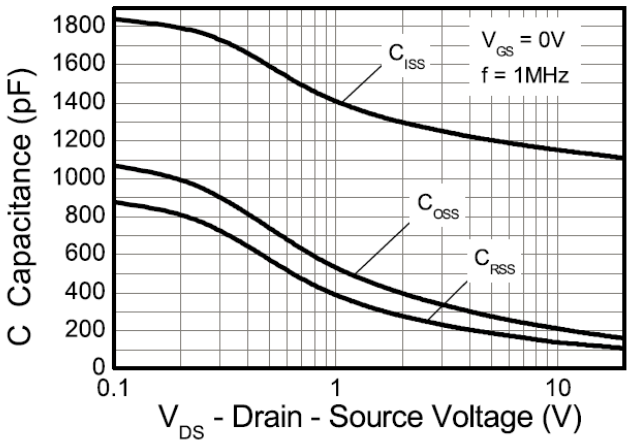


On-Resistance v Drain Current

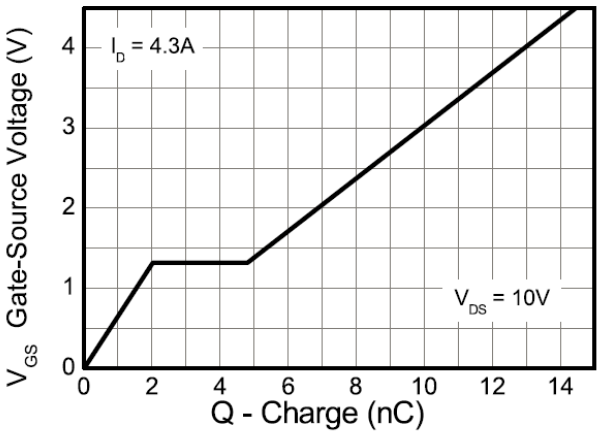


Source-Drain Diode Forward Voltage

Typical Characteristics (Cont.)

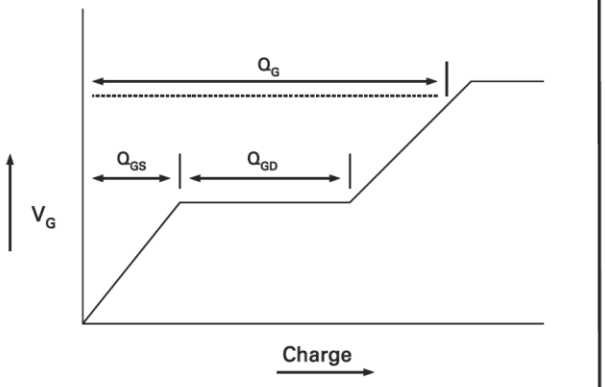


Capacitance v Drain-Source Voltage

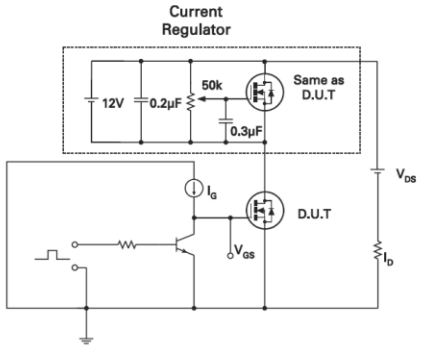


Gate-Source Voltage v Gate Charge

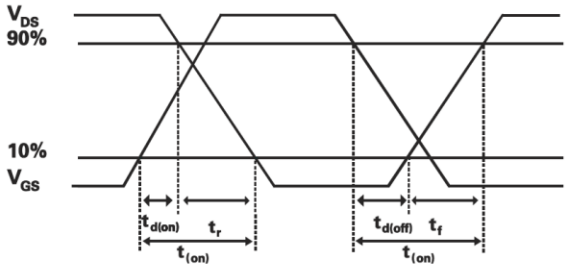
Test Circuits



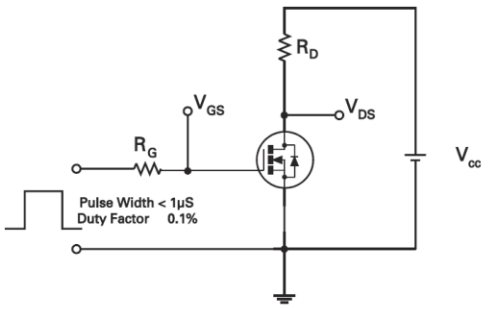
Basic Gate Charge Waveform



Gate Charge Test Circuit



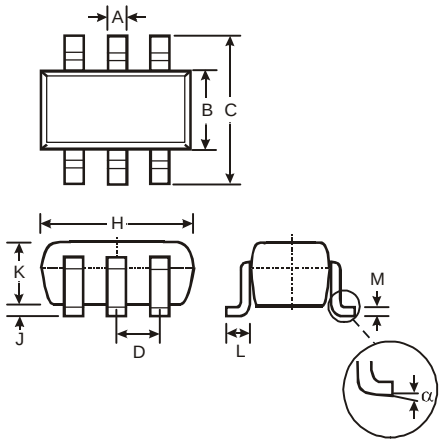
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

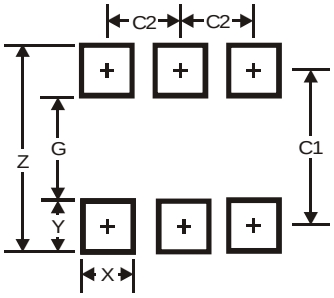
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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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