Lead-free Green

100V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV_{DSS}	Max $R_{DS(on)}$	Max I_D T_A = +25°C (Note 6)
100V	230mΩ @ V_{GS} = 10V	1.9A
	300mΩ @ V_{GS} = 4.5V	1.68A

Description and Applications

This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes it ideal for high-efficiency, low voltage, power management applications.

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

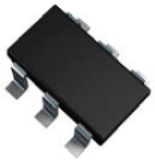
Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- SOT26 Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

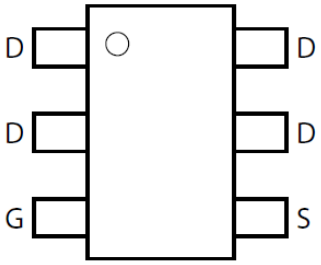
Mechanical Data

- 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)

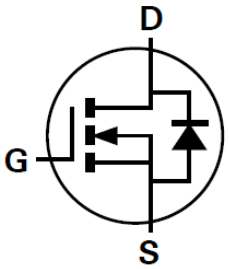
SOT26



Top View



Pinout Top-view



Device Symbol

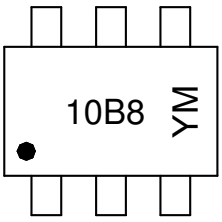
Ordering Information (Note 4)

Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXMN10B08E6TA	7	8	3,000
ZXMN10B08E6TC	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.

Marking Information

SOT26



10B8 = 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
Code	C	D	E	F	G	H	I	J

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.)

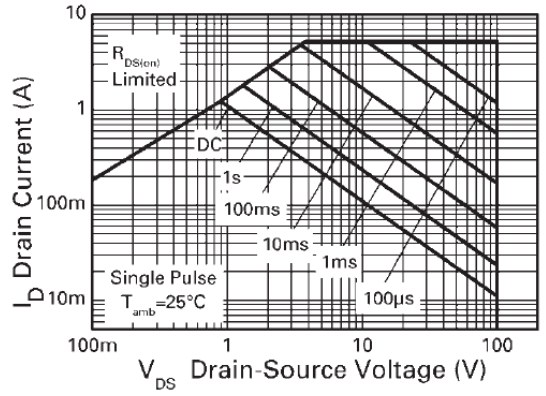
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	100	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current	V_{GS} = 10V	(Note 6)	I_D	1.9	A
		T_A = +70°C (Note 6)		1.5	
		(Note 5)		1.6	
Pulsed Drain Current		(Note 7)	I_{DM}	9	A
Continuous Source Current (Body Diode)		(Note 6)	I_S	2.5	A
Pulsed Source Current (Body Diode)		(Note 7)	I_{SM}	9	A

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

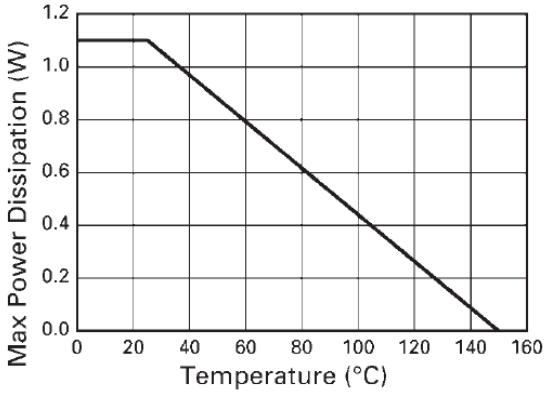
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.1	W
Linear Derating Factor			8.8	mW/°C
Power Dissipation	(Note 6)	P_D	1.7	W
Linear Derating Factor			13.6	mW/°C
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	113	°C/W
	(Note 6)		73	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. For a device surface mounted on FR4 PCB measured at t ≤ 5 secs.
7. Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02, pulse width 300µs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

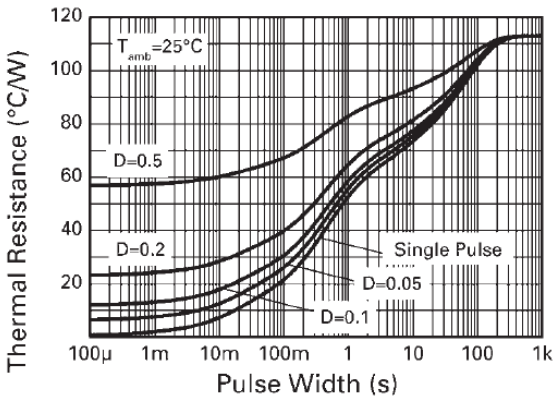
Thermal Characteristics



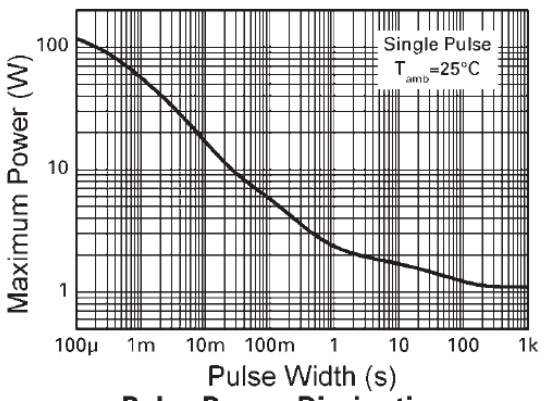
Safe Operating Area



Derating Curve



Transient Thermal Impedance



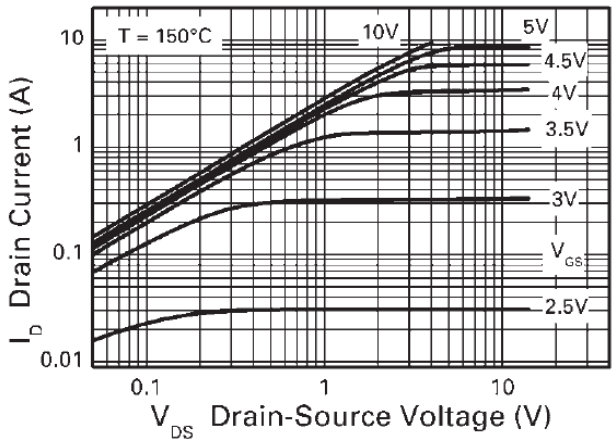
Pulse Power Dissipation

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

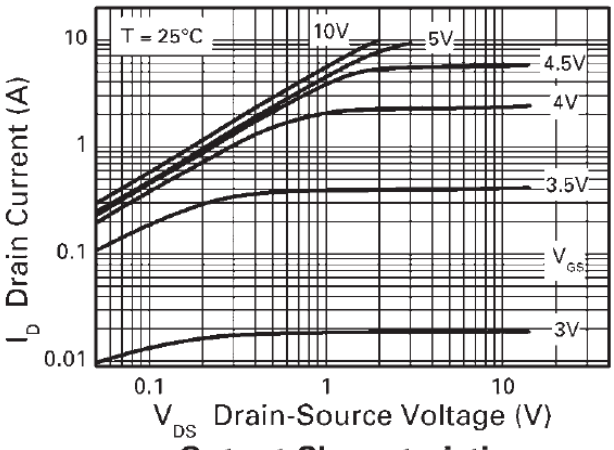
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	I_D = 250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	µA	V_{DS} = 100V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	3.0	V	I_D = 250µA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS(ON)}$	—	—	0.23	Ω	V_{GS} = 10V, I_D = 1.6A
				0.30		V_{GS} = 4.5V, I_D = 1.4A
				0.50		V_{GS} = 4.3V, I_D = 1.1A
Forward Transconductance (Notes 8 & 10)	g_{fs}	—	4.8	—	S	V_{DS} = 15V, I_D = 1.6A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.85	0.95	V	T_J = +25°C, I_S = 2.0A, V_{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	497	—	pF	V_{DS} = 50V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	29	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	18	—	pF	
Gate Charge (Note 9)	Q_g	—	5.0	—	nC	V_{DS} = 50V , V_{GS} = 5V, I_D = 1.6A
Total Gate Charge (Note 9)	Q_g	—	9.2	—	nC	V_{DS} = 50V, V_{GS} = 10V, I_D = 1.6A
Gate-Source Charge (Note 9)	Q_{gs}	—	1.7	—	nC	
Gate-Drain Charge (Note 9)	Q_{gd}	—	2.5	—	nC	
Turn-On Delay Time (Note 9)	$t_{d(on)}$	—	2.9	—	ns	V_{DD} = 50V, I_D = 1.0A, $R_G \cong 6.0\Omega$, V_{GS} = 10V
Turn-On Rise Time (Note 9)	t_r	—	2.1	—	ns	
Turn-Off Delay Time (Note 9)	$t_{d(off)}$	—	12.1	—	ns	
Turn-Off Fall Time (Note 9)	t_f	—	5.0	—	ns	
Reverse Recovery Time	t_{rr}	—	32	—	ns	T_J = +25°C, I_F = 1.7A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{rr}	—	40	—	nC	

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.

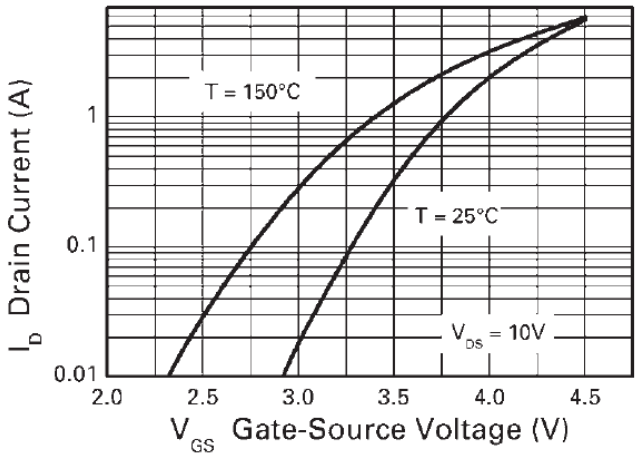
Typical Characteristics



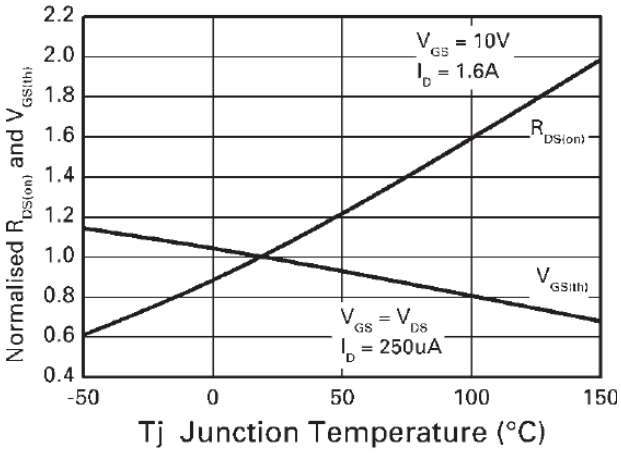
Output Characteristics



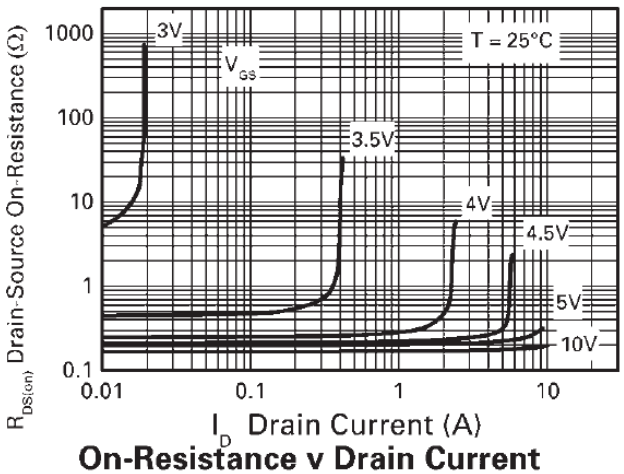
Output Characteristics



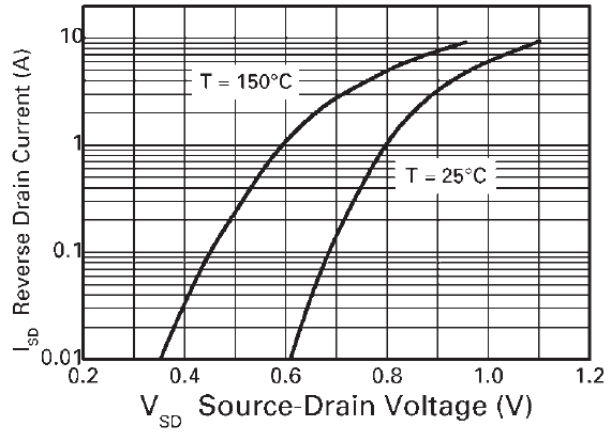
Typical Transfer Characteristics



Normalised Curves v Temperature

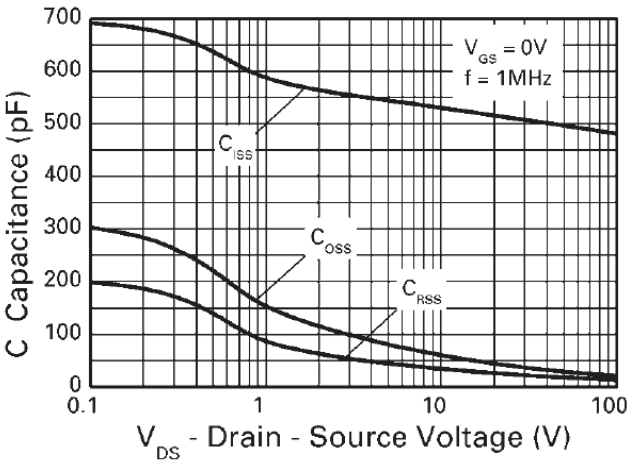


On-Resistance v Drain Current

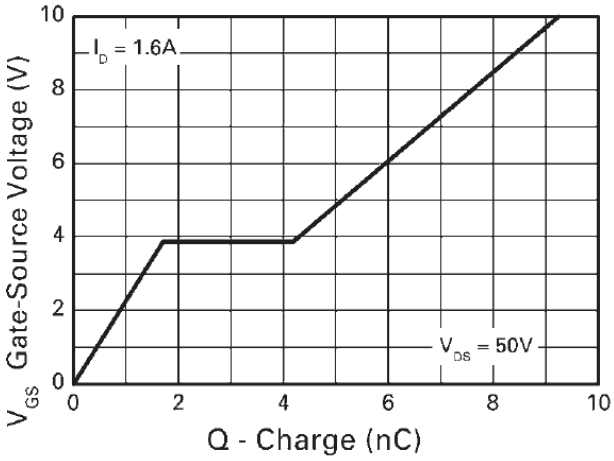


Source-Drain Diode Forward Voltage

Typical Characteristics (continued)

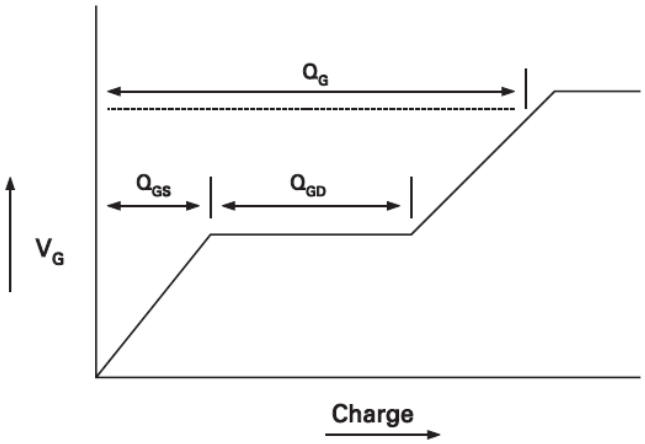


Capacitance v Drain-Source Voltage

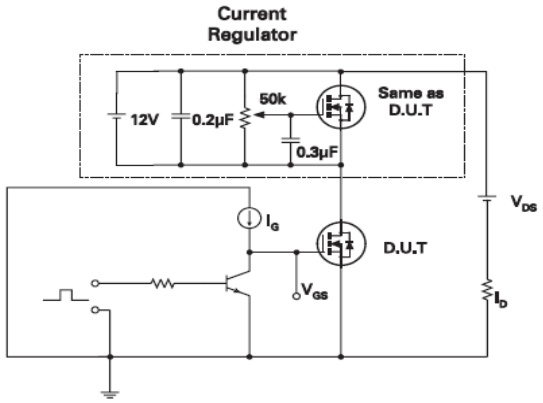


Gate-Source Voltage v Gate Charge

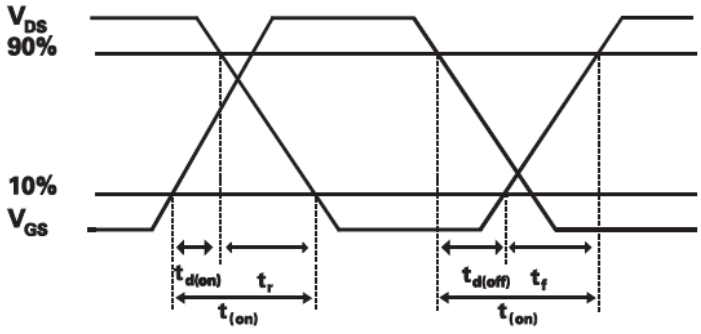
Test Circuits



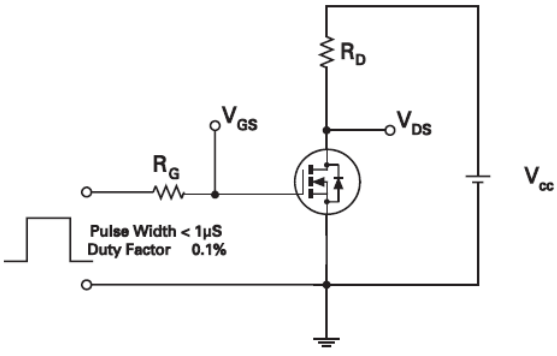
Basic Gate Charge Waveform



Gate Charge Test Circuit



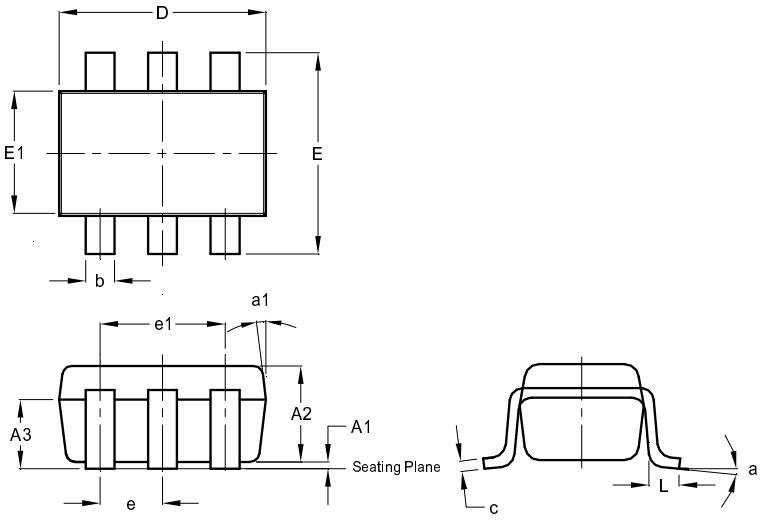
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

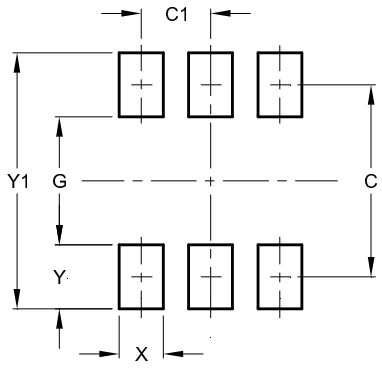
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26			
Dim	**Min**	**Max**	**Typ**
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 AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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

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