

20V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	Max R _{DS(ON)}	Max I _D T _A = +25°C
20V	0.1Ω @ V _{GS} = 4.5V	3.2A
	0.125Ω @ V _{GS} = 2.7V	2.8A

Description and Applications

This high-density MOSFET from Diodes Incorporated 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 such as:

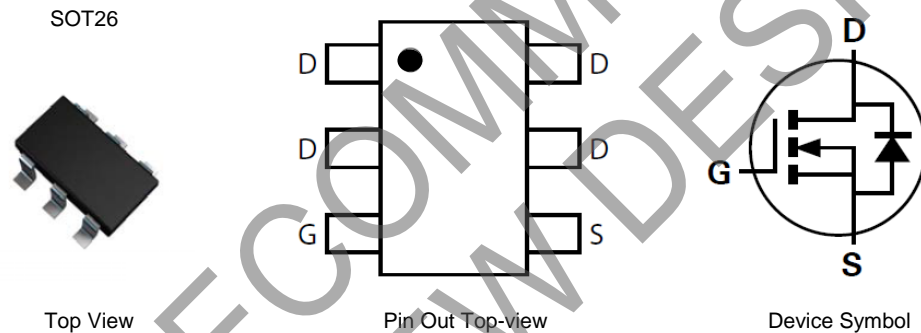
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

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 @3
- Weight: 0.015 grams (Approximate)

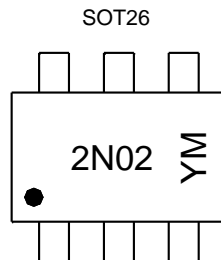


Ordering Information (Note 4)

Part Number	Reel Size (inch)	Tape Width (mm)	Quantity Per Reel
ZXM62N02E6TA	7	8	3,000
ZXM62N02E6TC	13	8	10,000

- 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



2N02 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: F = 2018)
 M or \bar{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.)

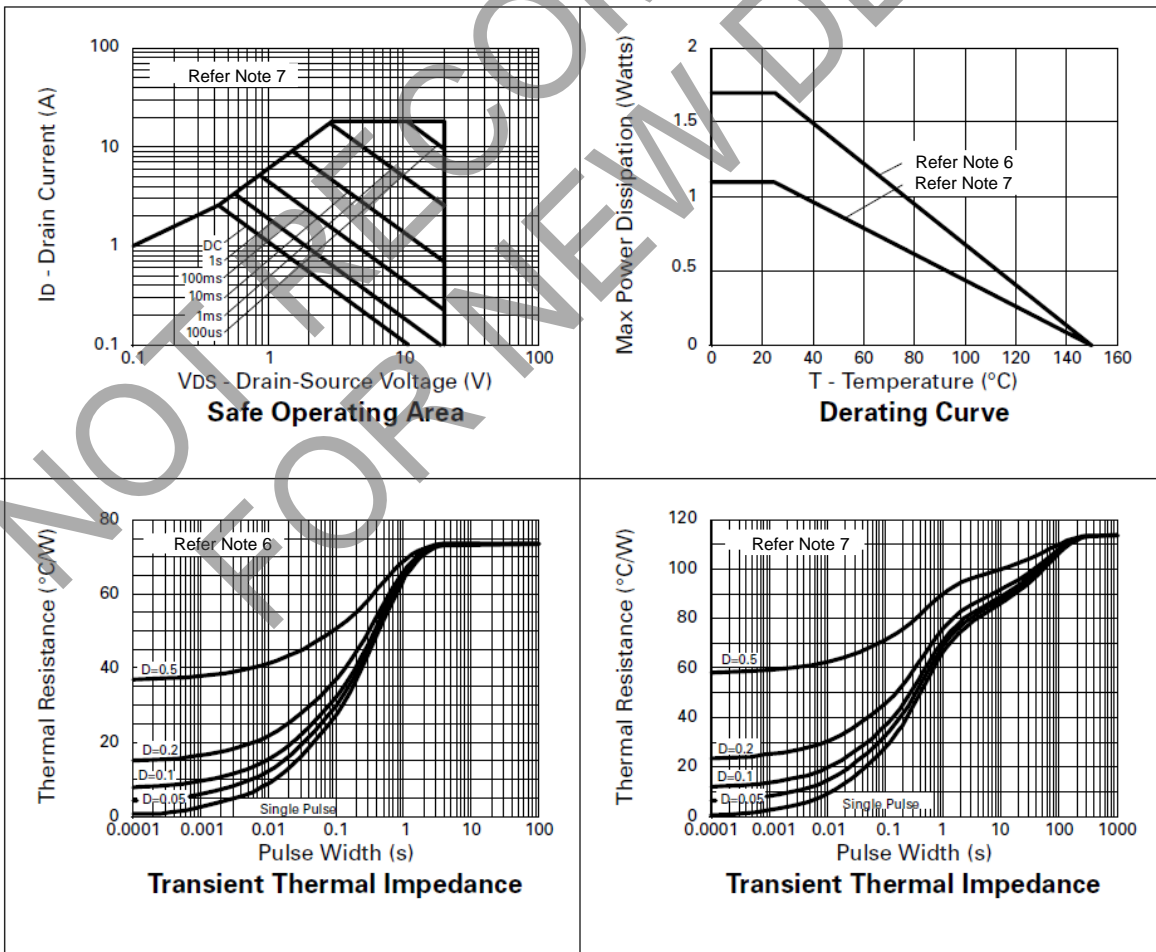
Characteristic		Symbol	Value	Unit	
Drain-Source Voltage		V _{DSS}	20	V	
Gate-Source Voltage		V _{GS}	±12	V	
Continuous Drain Current	V _{GS} = 4.5V	I _D	(Note 6)	3.2	A
			T _A = +70°C (Note 6)	2.6	
Pulsed Drain Current		I _{DM}	18	A	
Continuous Source Current (Body Diode)		I _S	2.1	A	
Pulsed Source Current (Body Diode)		I _{SM}	18	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	R _{θJA}		(Note 5)	113	°C/W
			(Note 6)	73	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C	

- 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 ≤ 5 seconds.
 - Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

Thermal Characteristics



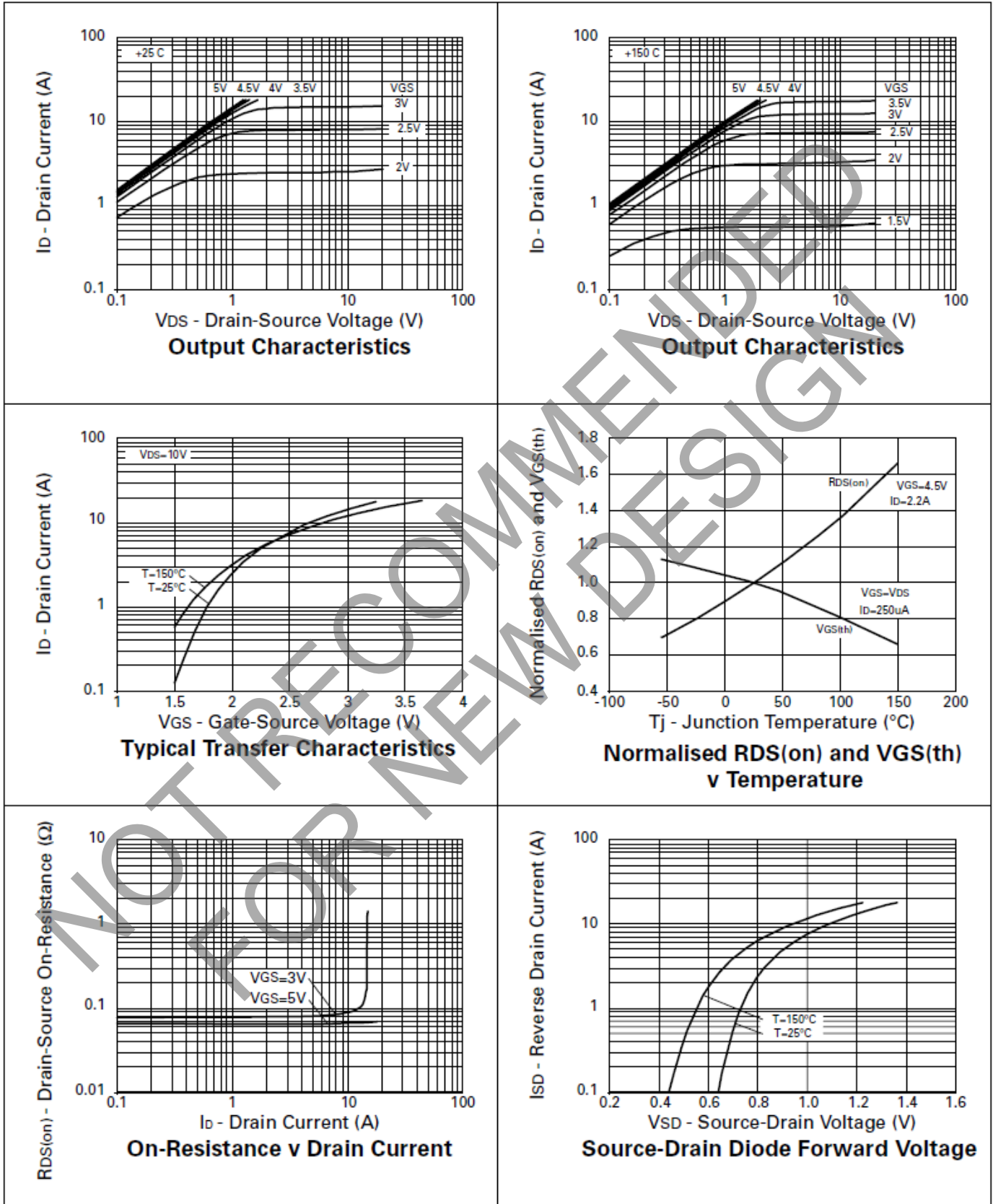
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate-Source Threshold Voltage	V _{GS(TH)}	0.7	—	—	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 8)	R _{DS(ON)}	—	—	0.1	Ω	V _{GS} = 4.5V, I _D = 2.2A
				0.125		V _{GS} = 2.7V, I _D = 1.1A
Forward Transconductance	g _{fs}	3.2	—	—	S	V _{DS} = 10V, I _D = 1.1A
Diode Forward Voltage (Note 8)	V _{SD}	—	—	0.95	V	T _J = +25°C, I _S = 2.2A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	460	—	pF	V _{DS} = 15V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	150	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	50	—	pF	
Total Gate Charge (Note 9)	Q _g	—	—	6.3	nC	V _{DS} = 16V, V _{GS} = 4.5V, I _D = 2.2A (refer to test circuit)
Gate-Source Charge (Note 9)	Q _{gs}	—	—	1.5	nC	
Gate-Drain Charge (Note 9)	Q _{gd}	—	—	2.5	nC	V _{DD} = 10V, I _D = 2.2A, R _G = 6.0Ω, R _D = 4.4Ω (refer to test circuit)
Turn-On Delay Time (Note 9)	t _{d(on)}	—	4.0	—	ns	
Turn-On Rise Time (Note 9)	t _r	—	10.4	—	ns	
Turn-Off Delay Time (Note 9)	t _{d(off)}	—	16.9	—	ns	
Turn-Off Fall Time (Note 9)	t _f	—	8.0	—	ns	T _J = +25°C, I _F = 2.2A, di/dt = 100A/μs
Reverse Recovery Time	t _{rr}	—	17.5	—	ns	
Reverse Recovery Charge	Q _{rr}	—	8.6	—	nC	

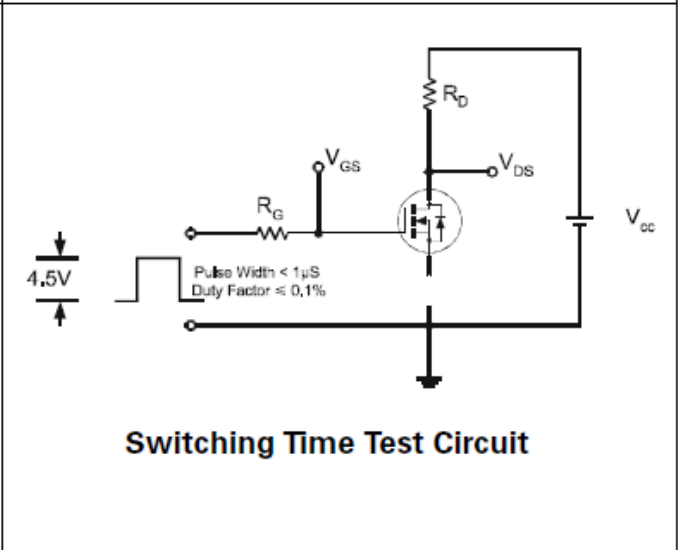
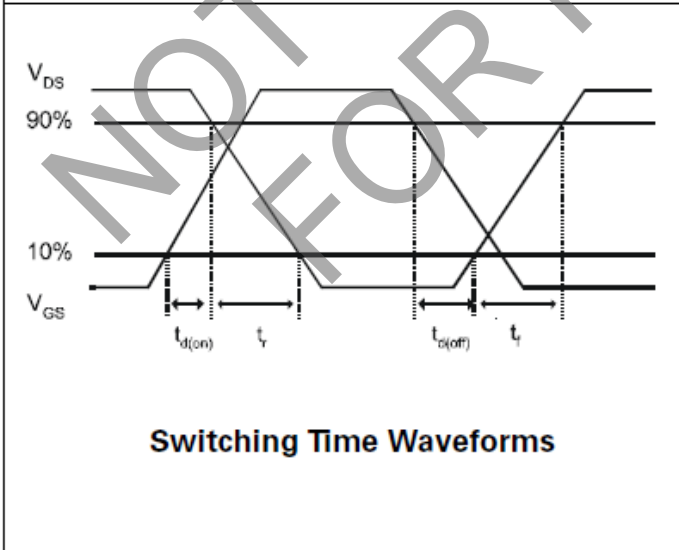
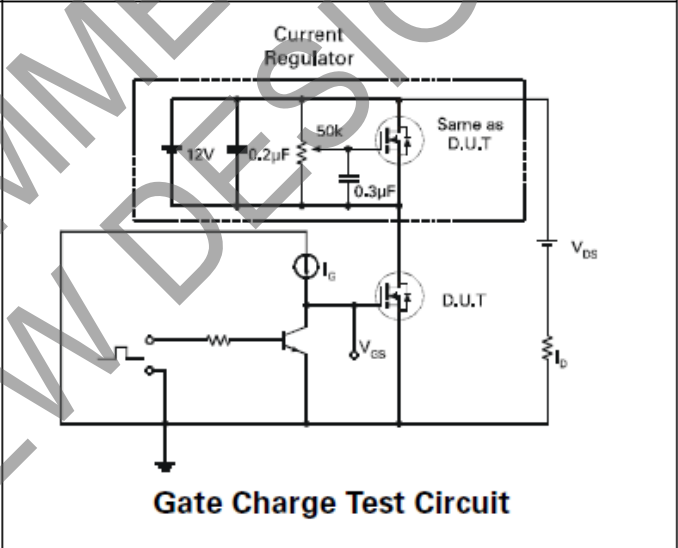
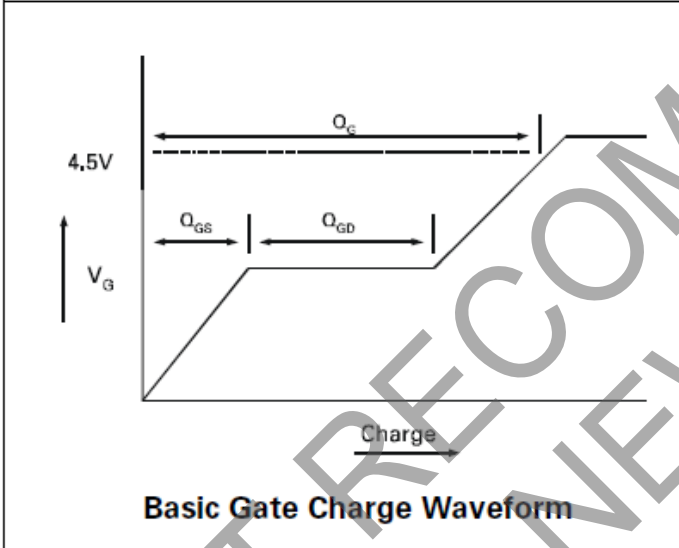
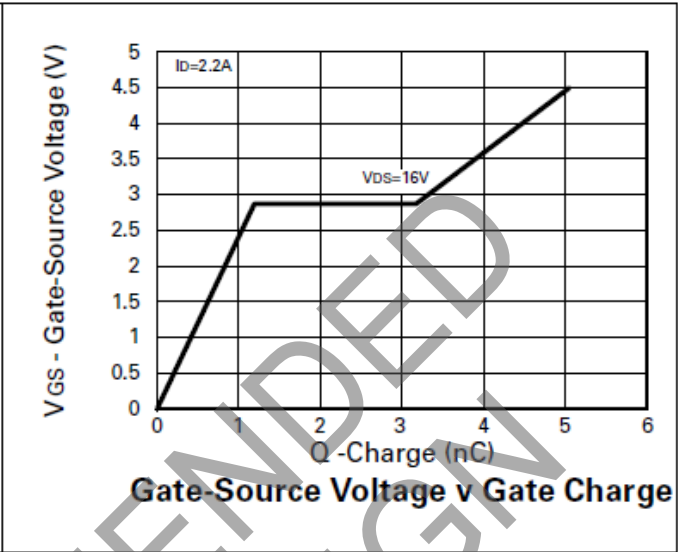
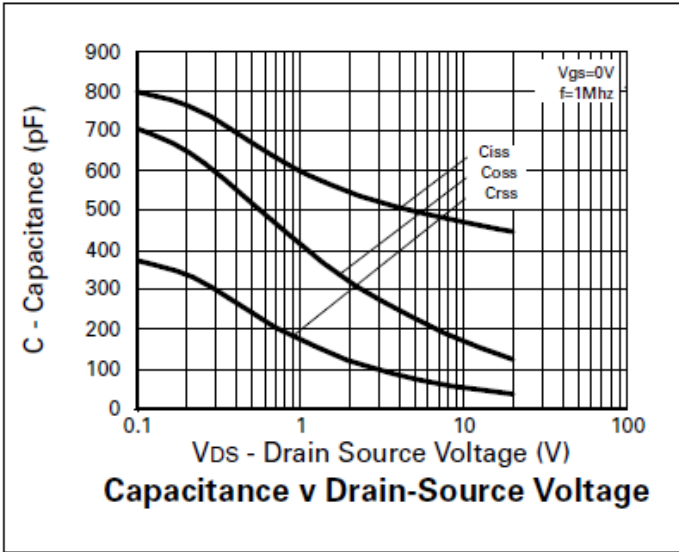
Notes:
 8. Measured under pulsed conditions. Width ≤ 300μs. Duty cycle ≤ 2%.
 9. Switching characteristics are independent of operating junction temperature.
 10. For design aid only, not subject to production testing.

NOT RECOMMENDED FOR NEW DESIGN

Typical Characteristics



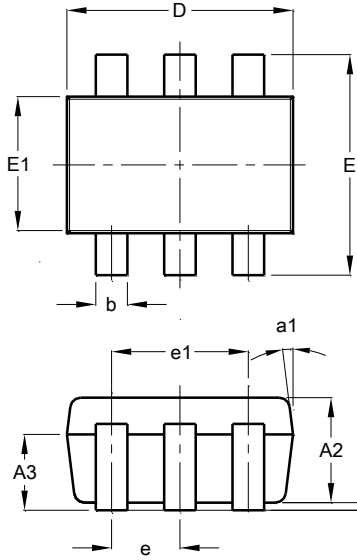
Typical Characteristics (cont.)



Package Outline Dimensions

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

SOT26

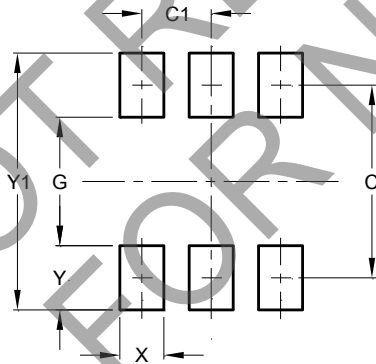


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

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

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