

DUAL 30V N-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	I_D $T_A = +25^\circ\text{C}$ (Notes 5 & 6)
30V	135m Ω @ $V_{GS} = 10\text{V}$	MSOP-8	2.3A
	200m Ω @ $V_{GS} = 4.5\text{V}$		1.9A

Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

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

Features

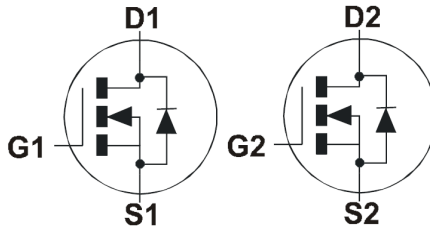
- Low On-Resistance
- Low Threshold
- Fast Switching Speed
- Low Gate Drive
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

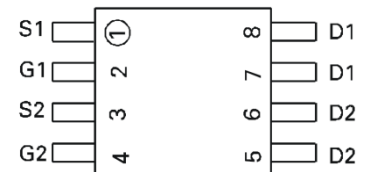
- Case: MSOP-8
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish ③
- Weight: 0.008 grams (approximate)



Top View



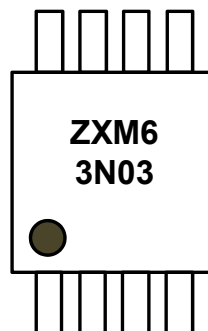
Device Symbol


 Top View
Pin-Out

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMD63N03XTA	ZXM63N03	7	12	1,000
ZXMD63N03XTC	ZXM63N03	13	12	4,000

- 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


ZXM63N03 = Product type Marking Code

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

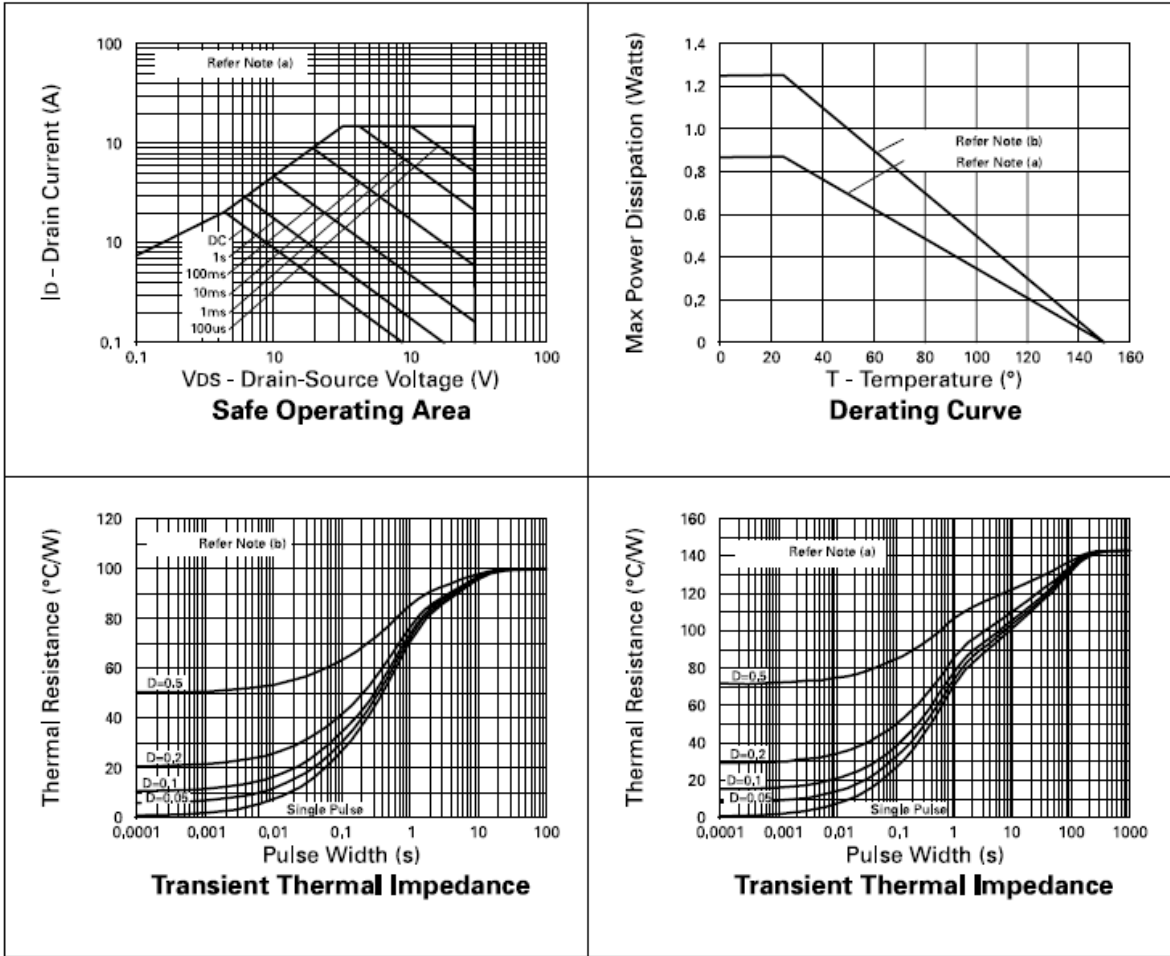
Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current	Steady State	@ $V_{GS} = 4.5\text{V}$; $T_A = +25^\circ\text{C}$ (Note 5 & 6)	I_D	2.3	A
		@ $V_{GS} = 4.5\text{V}$; $T_A = +70^\circ\text{C}$ (Note 5 & 6)		1.8	
Pulsed Drain Current		(Notes 6 & 7)	I_{DM}	14	A
Continuous Source Current (Body Diode)		(Notes 5 & 6)	I_S	1.5	A
Pulsed Source Current (Body Diode)		(Notes 6 & 7)	I_{SM}	14	A

Thermal Characteristics

Characteristic		Symbol	Value	Unit	
Power Dissipation	(Notes 6 & 8)	P_D	0.87	W	
	(Notes 5 & 6)		1.25		
	(Notes 8 & 9)		1.04		
Thermal Resistance, Junction to Ambient	(Notes 6 & 8)	$R_{\theta JA}$	143	$^\circ\text{C/W}$	
	(Notes 5 & 6)		100		
	(Notes 8 & 9)		120		
Thermal Resistance, Junction to Leads		(Note 10)	$R_{\theta JL}$	84.9	$^\circ\text{C/W}$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$	

- Notes:
5. For a device surface mounted on FR4 PCB measured at $t \leq 10$ sec.
 6. For device with one active die.
 7. Repetitive rating - 25mm x 25mm FR4 PCB, $D = 0.02$, pulse width 300 μs – pulse width limited by maximum junction temperature.
 8. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 9. For device with two active die running at equal power.
 10. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics

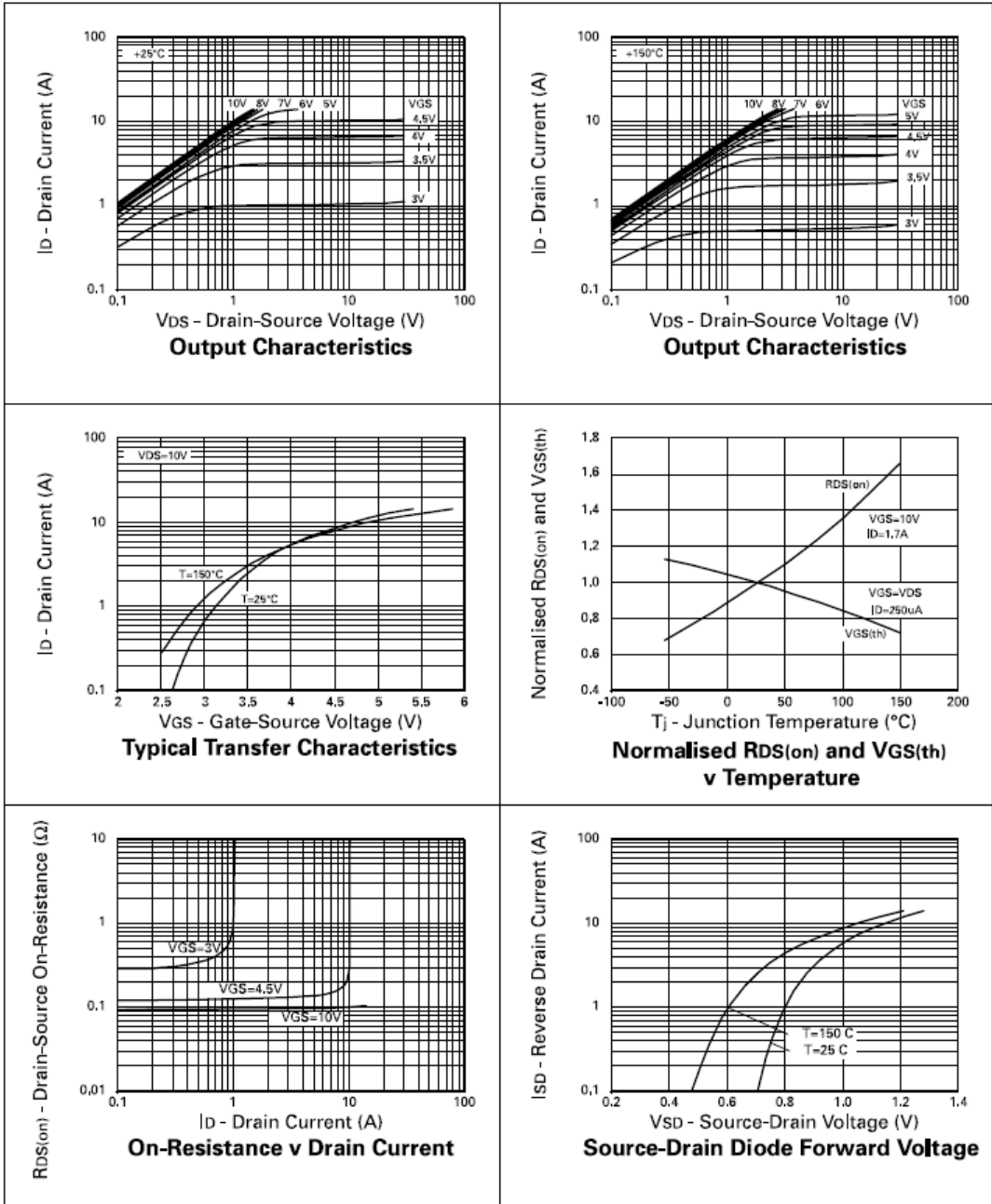


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

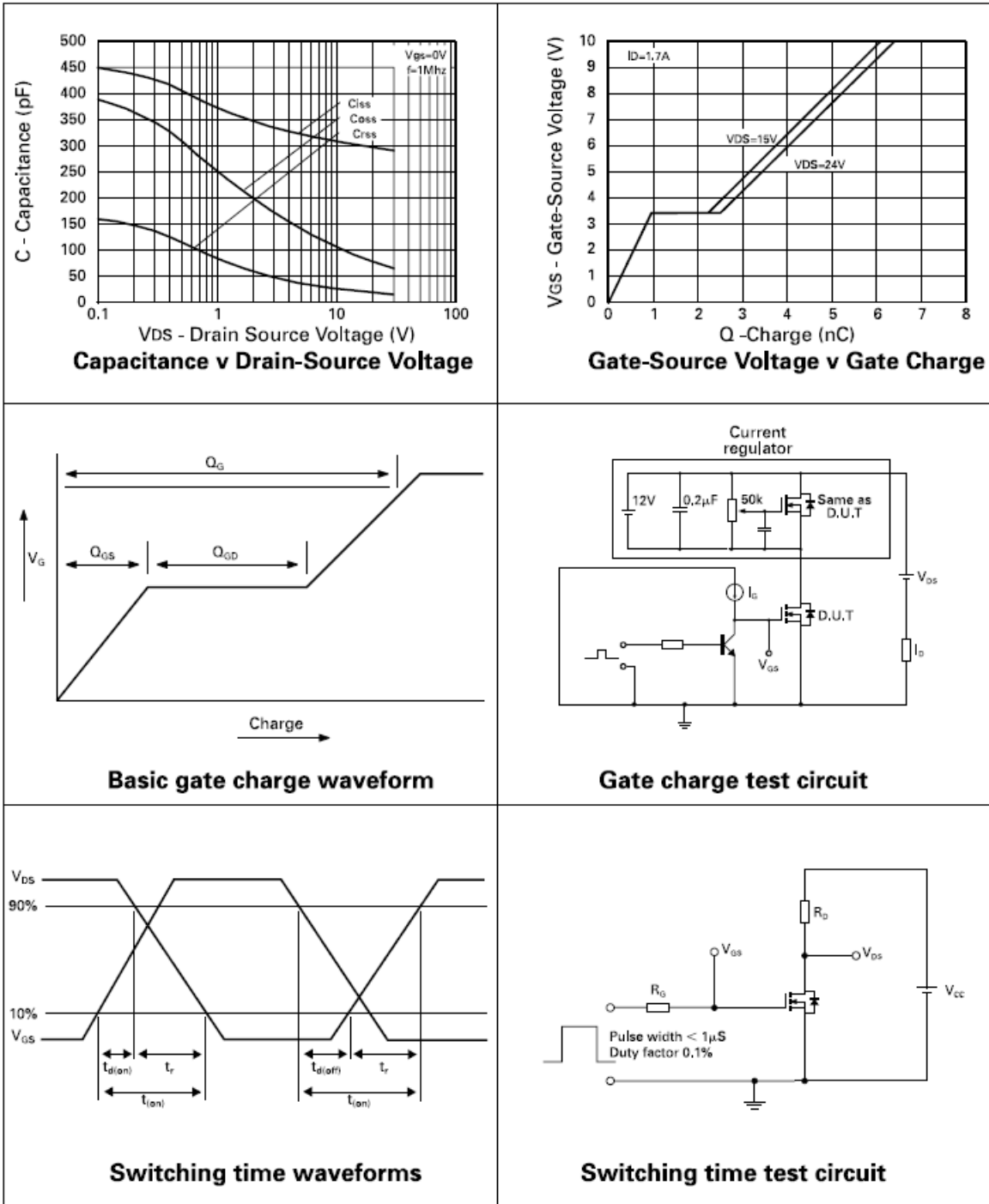
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	1.0	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance (Note 11)	R _{DS(on)}	—	—	135	mΩ	V _{GS} = 10V, I _D = 1.7A
				200		V _{GS} = 4.5V, I _D = 0.85A
Forward Transconductance (Notes 11 & 13)	g _{fs}	1.9	—	—	S	V _{DS} = 10V, I _D = 0.85A
Diodes Forward Voltage (Note 11)	V _{SD}	—	—	0.95	V	T _J = 25°C, I _S = 1.7A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 12 & 13)	C _{iss}	—	290	—	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance (Notes 12 & 13)	C _{oss}	—	70	—		
Reverse Transfer Capacitance (Notes 12 & 13)	C _{rss}	—	20	—		
Total Gate Charge (Notes 12 & 13)	Q _g	—	—	8	nC	V _{GS} = 10V, V _{DS} = 24V, I _D = 1.7A
Gate-Source Charge (Notes 12 & 13)	Q _{gs}	—	—	1.2		
Gate-Drain Charge (Notes 12 & 13)	Q _{gd}	—	—	2		
Reverse Recovery Time (Note 13)	t _{rr}	—	16.9	—	ns	T _J = +25°C, I _F = 1.7A, di/dt = 100A/μs
Reverse Recovery Charge (Note 13)	Q _{rr}	—	9.5	—	nC	
Turn-On Delay Time (Notes 12 & 13)	t _{D(on)}	—	2.5	—	ns	V _{DD} = 15V, I _D = 1.7A, R _G = 6.1Ω, R _D = 8.7Ω,
Turn-On Rise Time (Notes 12 & 13)	t _r	—	4.1	—		
Turn-Off Delay Time (Notes 12 & 13)	t _{D(off)}	—	9.6	—		
Turn-Off Fall Time (Notes 12 & 13)	t _f	—	4.4	—		

- Notes:
11. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 12. Switching characteristics are independent of operating junction temperature.
 13. For design aid only, not subject to production testing.

Typical Characteristics

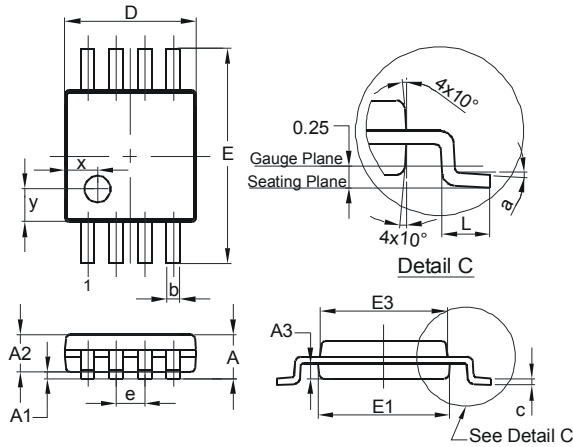


Typical Characteristics (cont.)



Package Outline Dimensions

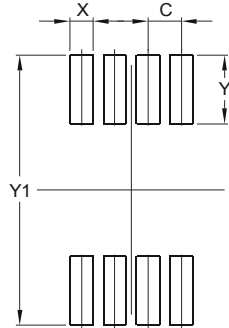
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



MSOP-8			
Dim	Min	Max	Typ
A	-	1.10	-
A1	0.05	0.15	0.10
A2	0.75	0.95	0.86
A3	0.29	0.49	0.39
b	0.22	0.38	0.30
c	0.08	0.23	0.15
D	2.90	3.10	3.00
E	4.70	5.10	4.90
E1	2.90	3.10	3.00
E3	2.85	3.05	2.95
e	-	-	0.65
L	0.40	0.80	0.60
a	0°	8°	4°
x	-	-	0.750
y	-	-	0.750
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	0.650
X	0.450
Y	1.350
Y1	5.300

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