

Product Summary

BV _{DSS}	Max R _{DS(ON)}	Max I _D T _A = +25°C (Note 7)
60V	250mΩ @ V _{GS} = 10V	1.4A
	350mΩ @ V _{GS} = 4.5V	1.2A

Description and Applications

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

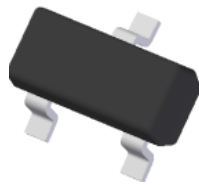
- DC-DC converters
- Power-management functions
- Relay and solenoid driving
- Motor controls

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Charge
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

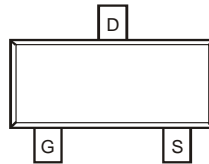
Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish[Ⓜ]
- Weight: 0.008 grams (Approximate)

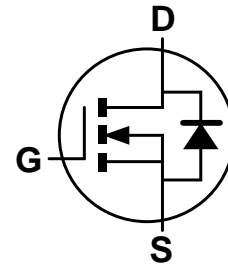


Top View

SOT23



Top View
Pin Out



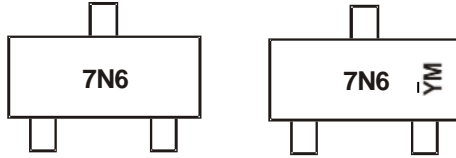
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZXMN6A07FTA	SOT23	3,000	Tape & Reel

- 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

SOT23


7N6 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: K = 2023)
 M = Month (ex: 9 = September)

Date Code Key

Year	2010	...	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	X	...	K	L	M	N	P	R	S	T	U	V

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.)

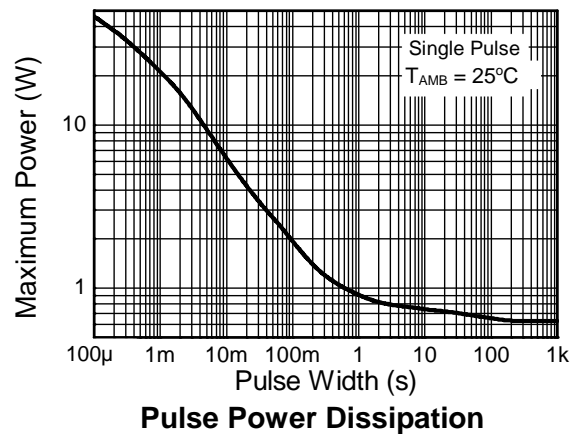
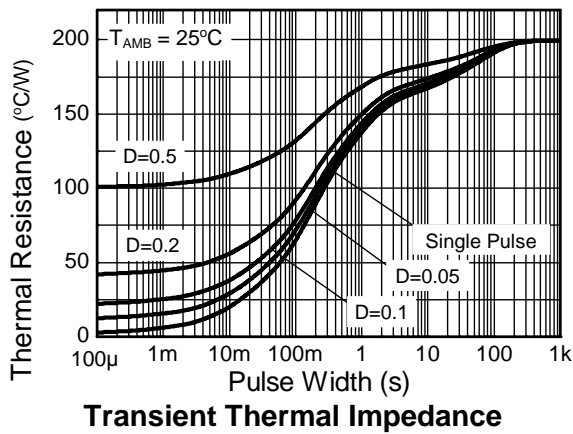
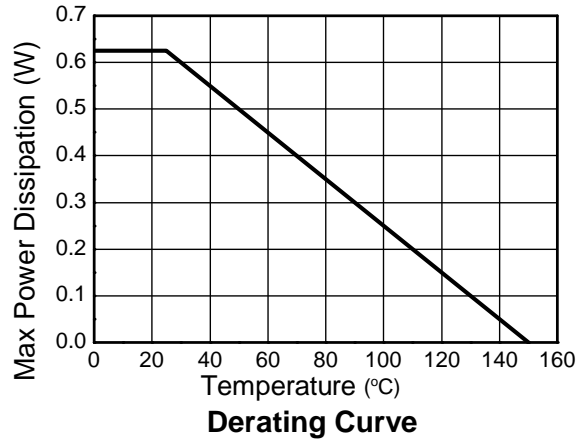
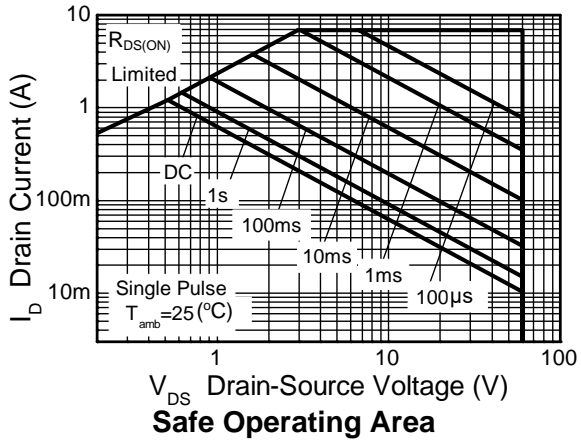
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	V _{GS} = 10V	T _A = +25°C (Note 6)	1.4	A
		T _A = +70°C (Note 6)	1.1	
		T _A = +25°C (Note 5)	1.2	
Pulsed Drain Current (Note 7)		I _{DM}	6.9	A
Continuous Source Current (Body Diode) (Note 6)		I _S	1	A
Pulsed Source Current (Body Diode) (Note 7)		I _{SM}	6.9	A

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P _D	625	mW
Linear Derating Factor			5	
Power Dissipation (Note 6)		P _D	806	mW
Linear Derating Factor			6.4	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	200	°C/W
	(Note 6)		155	
Thermal Resistance, Junction to Ambient (Note 8)		R _{θJL}	194	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 - For a device surface mounted on FR4 PCB measured at t ≤ 5secs.
 - Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02 pulse width = 300μs - pulse current limited by maximum junction temperature.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics (continued)

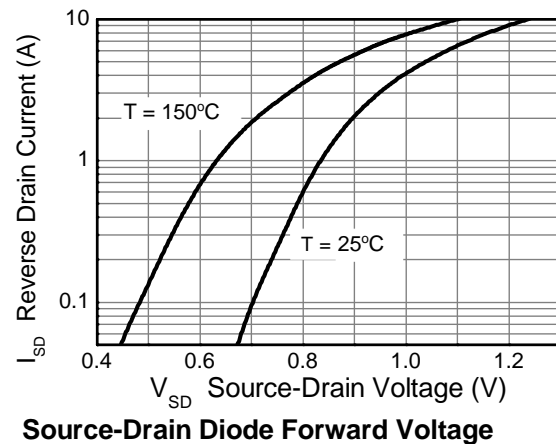
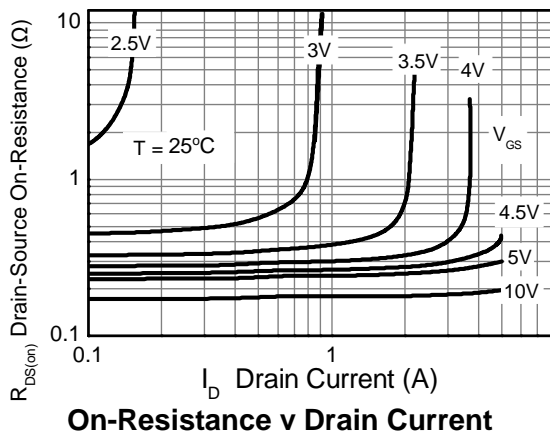
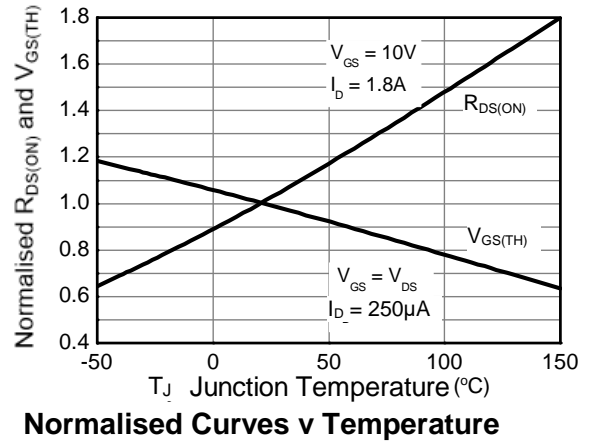
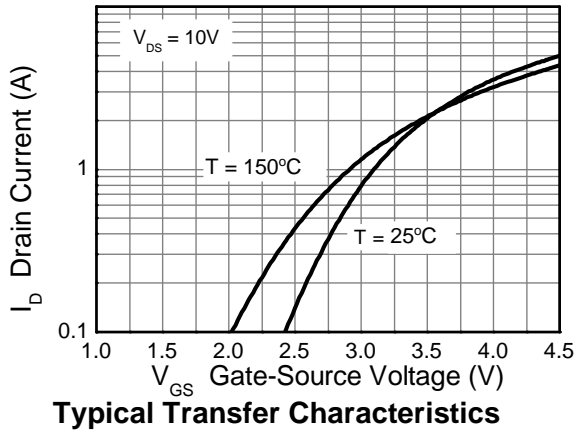
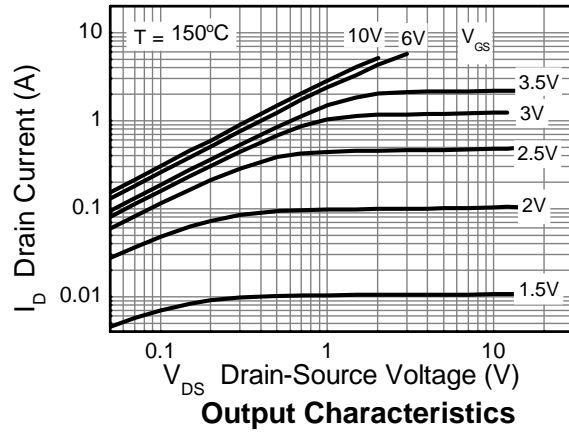
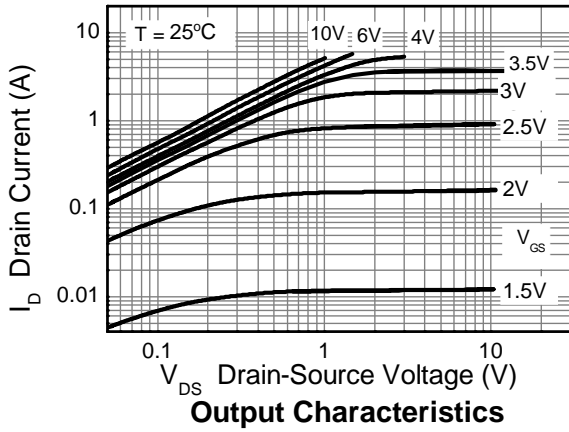


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

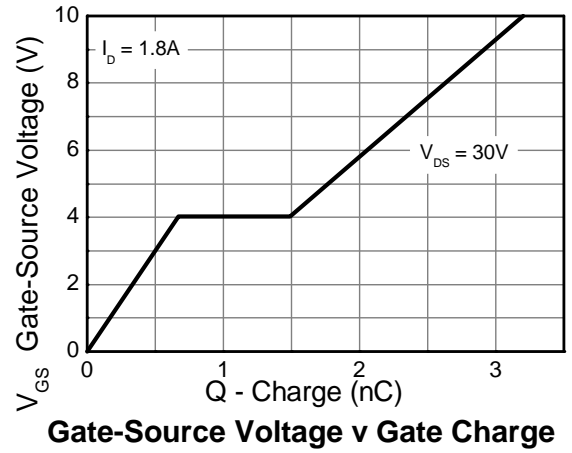
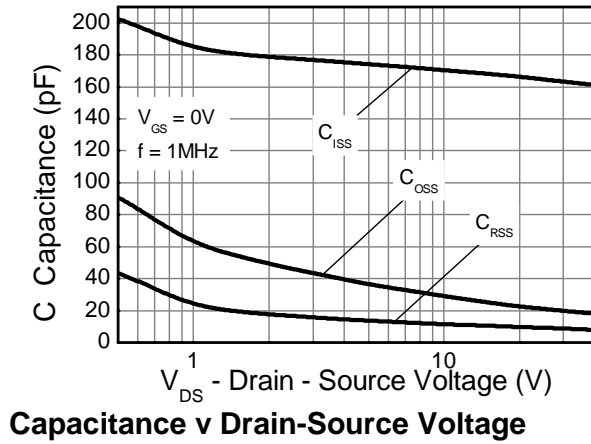
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 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 9)	R _{DS(ON)}	—	—	0.250	Ω	V _{GS} = 10V, I _D = 1.8A
				0.350		V _{GS} = 4.5V, I _D = 1.3A
Forward Transconductance (Notes 9 and 11)	G _{FS}	—	2.3	—	S	V _{DS} = 15V, I _D = 1.8A
Diode Forward Voltage (Note 9)	V _{SD}	—	0.8	0.95	V	T _J = +25°C, I _S = 0.45A, V _{GS} = 0V
Reverse Recovery Time (Note 11)	t _{RR}	—	20.5	—	ns	T _J = +25°C, I _F = 1.8A,
Reverse Recovery Charge (Note 11)	Q _{RR}	—	21.3	—	nC	di/dt = 100A/μs
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C _{iss}	—	166	—	pF	V _{DD} = 40V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	19.5	—		
Reverse Transfer Capacitance	C _{rss}	—	8.7	—		
Turn-On Delay Time (Note 10)	t _{D(ON)}	—	1.8	—	ns	V _{DD} = 30V, I _D = 1.8A, R _G ≅ 6.0Ω, V _{GS} = 10V
Turn-On Rise Time (Note 10)	t _R	—	1.4	—		
Turn-Off Delay Time (Note 10)	t _{D(OFF)}	—	4.9	—		
Turn-Off Fall Time (Note 10)	t _F	—	2.0	—		
Total Gate Charge (Note 10)	Q _g	—	1.65	—	nC	V _{DS} = 30V, V _{GS} = 5V, I _D = 1.8A
Total Gate Charge (Note 10)	Q _g	—	3.2	—	nC	V _{DS} = 30V, V _{GS} = 10V, I _D = 1.8A
Gate-Source Charge (Note 10)	Q _{gs}	—	0.67	—		
Gate-Drain Charge (Note 10)	Q _{gd}	—	0.82	—		

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

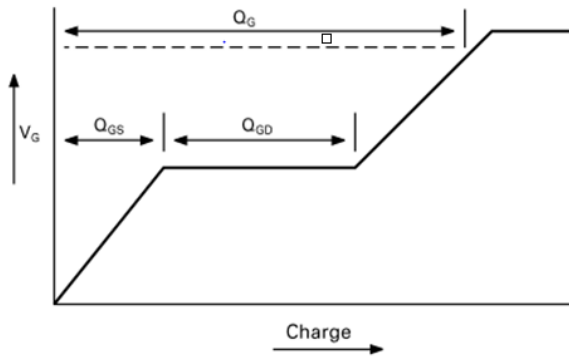
Typical Characteristics



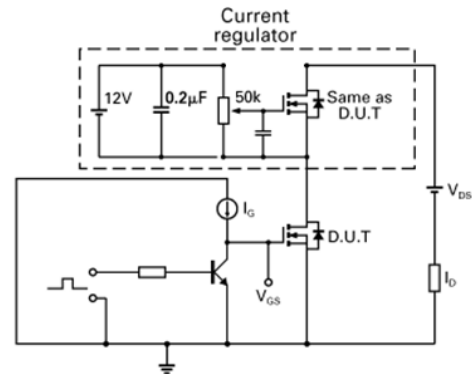
Typical Characteristics (continued)



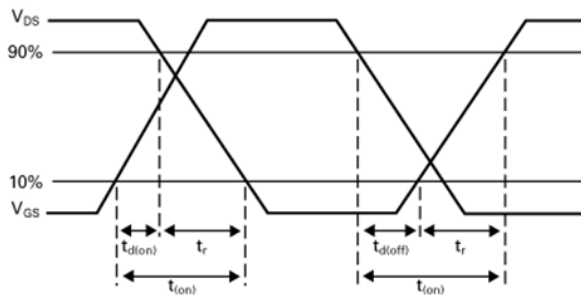
Test Circuits



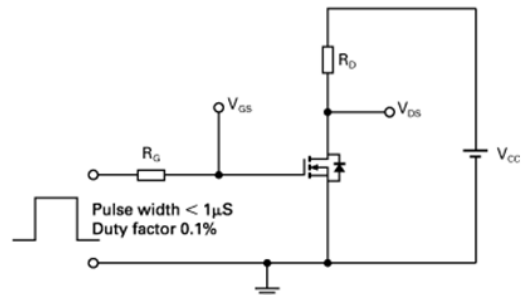
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

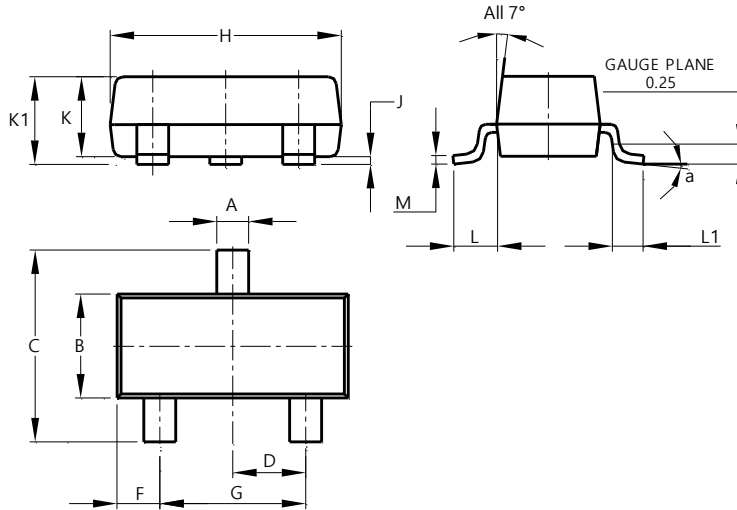


Switching time test circuit

Package Outline Dimensions

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

SOT23

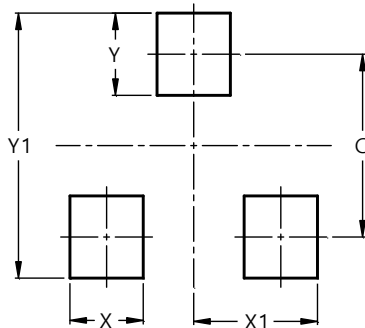


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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