

Product Summary

Device	BV _{DSS}	R _{DS(ON)} max	I _D max T _A = +25°C
N-Channel	60V	0.3Ω @ V _{GS} = 10V	1.8A
		0.45Ω @ V _{GS} = 4.5V	1.4A
P-Channel	-60V	0.425Ω @ V _{GS} = -10V	-1.5A
		0.63Ω @ V _{GS} = -4.5V	-1.2A

Description

This new generation complementary MOSFET H-Bridge features low on-resistance achievable with low gate drive.

Applications

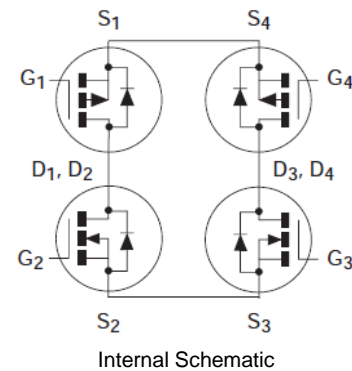
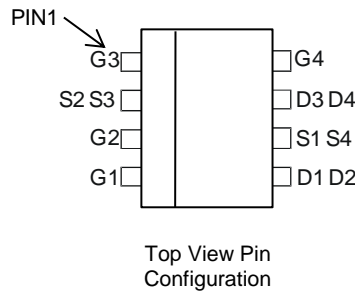
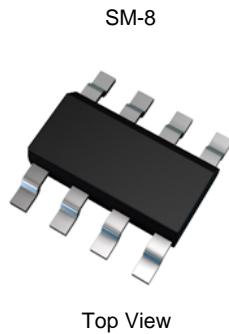
- DC Motor Control
- DC-AC Inverters

Features

- 2 x N + 2 x P Channels in a SOIC Package
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SM-8 (8 LEAD SOT223)
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.117 grams (Approximate)

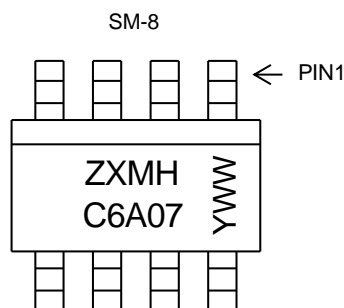


Ordering Information (Note 4)

Part Number	Reel Size	Tape Width	Quantity Per Reel
ZXMHC6A07T8TA	7"	12mm	1,000 units
ZXMHC6A07T8TC	13"	12mm	4,000 units

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 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



ZXMHC6A07 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

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

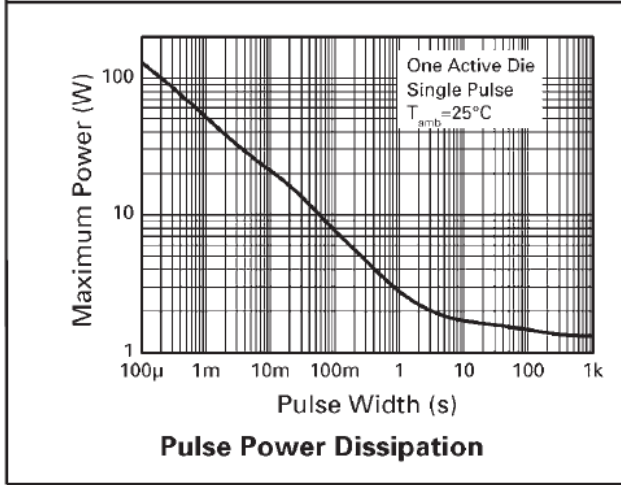
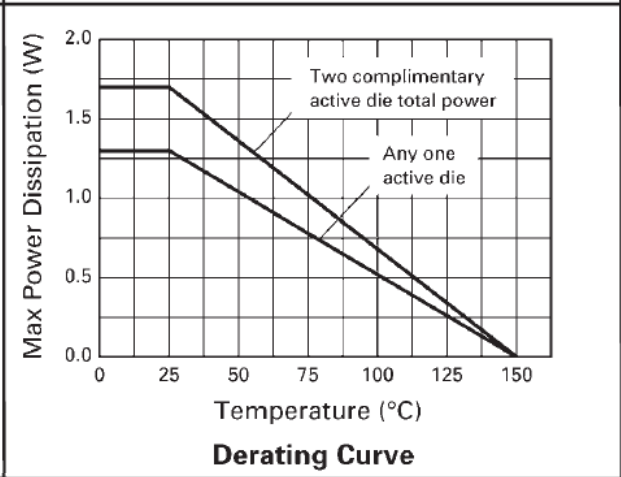
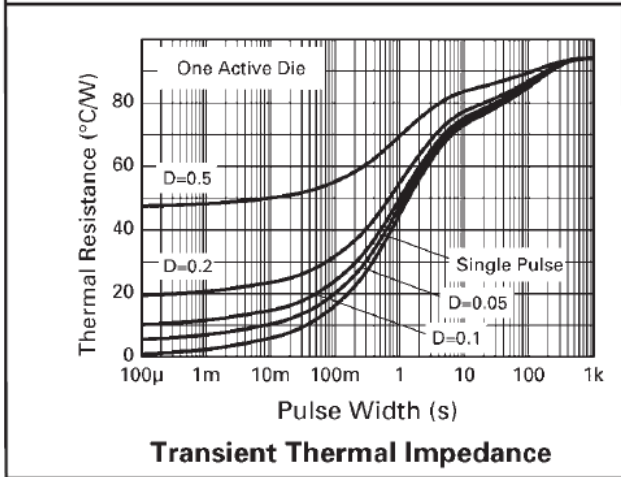
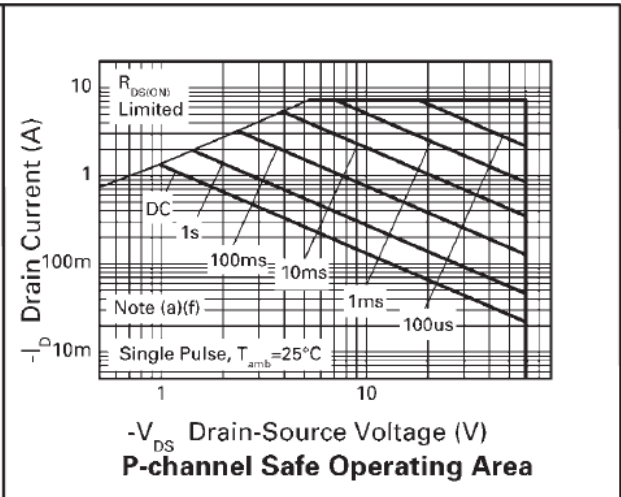
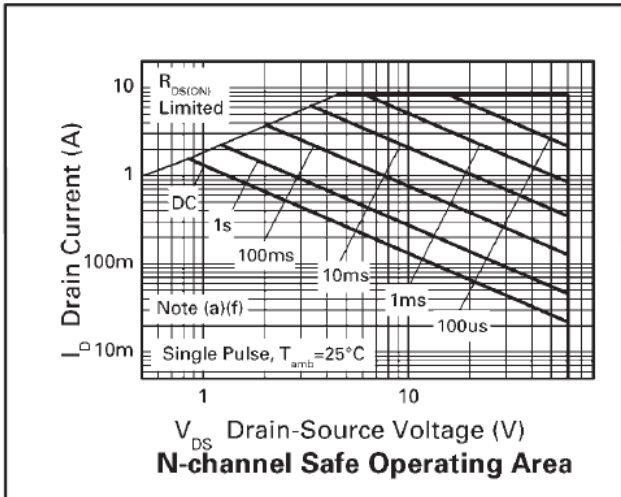
Characteristic		Symbol	N-channel	P-channel	Units
Drain-Source Voltage		V_{DSS}	60	-60	V
Gate-Source Voltage		V_{GSS}	± 20	± 20	V
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 8)	Steady State	$T_A = +25^\circ\text{C}$ (Note 6)	1.8	-1.5	A
		$T_A = +70^\circ\text{C}$ (Note 6)	1.4	-1.2	
		$T_A = +25^\circ\text{C}$ (Note 5)	1.6	-1.3	
Maximum Body Diode Forward Current (Note 6)		I_S	2.3	-2.1	A
Pulsed Drain Current (Note 7)		I_{DM}	8.4	-7.2	A
Pulsed Source Current (Note 7)		I_{SM}	8.4	-7.2	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 8)	$T_A = +25^\circ\text{C}$ (Note 5)	P_D	1.3	W
Linear Derating Factor			10.4	$\text{mW}/^\circ\text{C}$
Total Power Dissipation (Note 8)	$T_A = +25^\circ\text{C}$ (Note 6)	P_D	1.7	W
Linear Derating Factor			13.6	$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 8)	Steady State (Note 5)	$R_{\theta JA}$	94.5	$^\circ\text{C}/\text{W}$
	Steady State (Note 6)		73.3	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
- For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions, with the heat sink split into two equal areas one for each drain connection.
 - For a device surface mounted on FR4 PCB measured at $t \leq 10$ seconds.
 - Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, $D = 0.02$, pulse width 300 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
 - For device with one active die.

Typical Characteristics



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

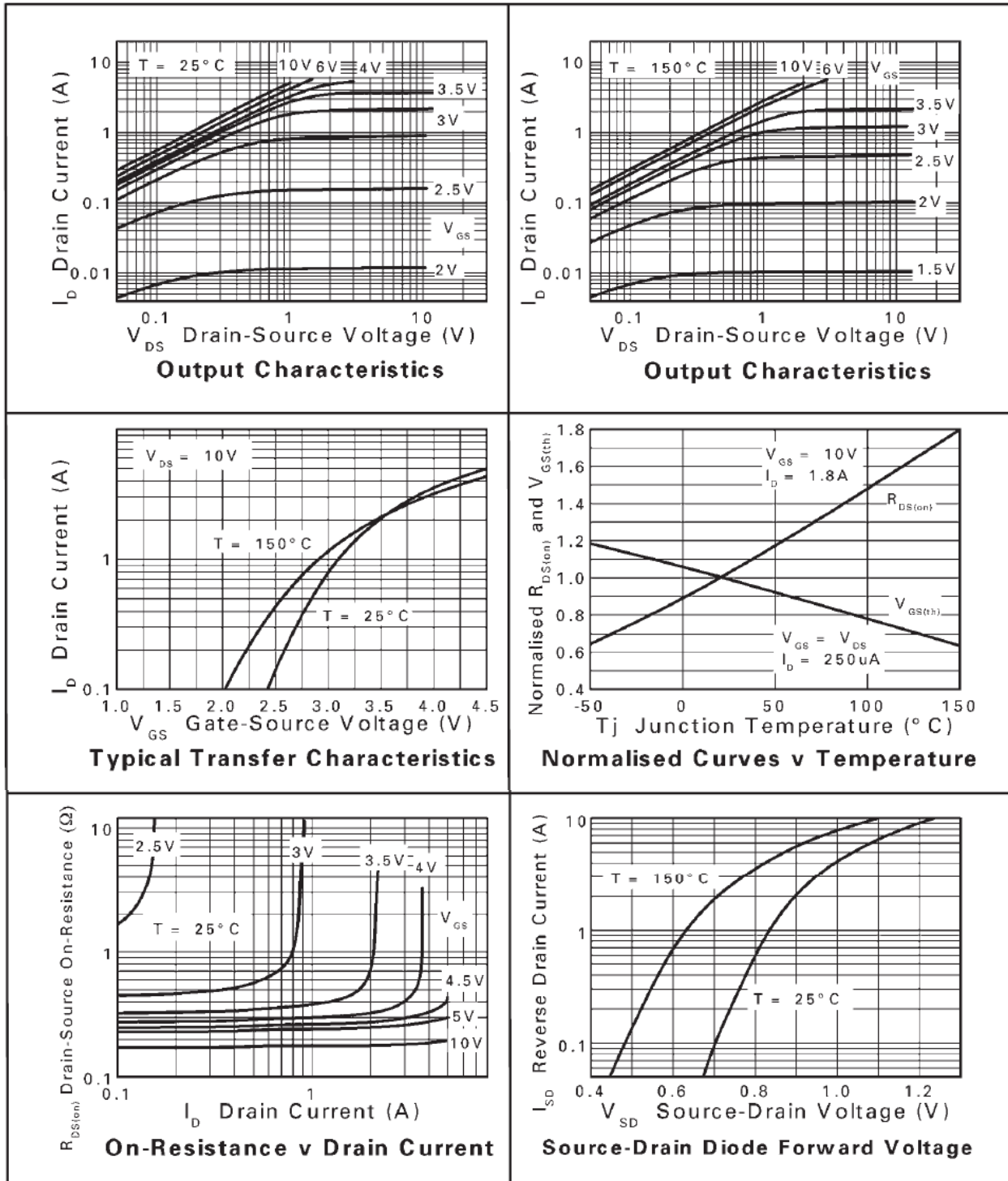
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 10)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	μA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 10)						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	3.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance (Note 9)	R _{DS(ON)}	—	—	0.3	Ω	V _{GS} = 10V, I _D = 1.8A
		—	—	0.45		V _{GS} = 4.5V, I _D = 1.3A
Forward Transfer Admittance (Notes 9 & 11)	g _{fs}	—	2.3	—	S	V _{DS} = 15V, I _D = 1.8A
Diode Forward Voltage (Note 9)	V _{SD}	—	0.85	0.95	V	T _J = +25°C, V _{GS} = 0V, I _S = 0.45A
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C _{iss}	—	166	—	pF	V _{DS} = 40V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	19.5	—		
Reverse Transfer Capacitance	C _{rss}	—	8.7	—		
Gate Charge (V _{GS} = -5.0V)	Q _g	—	1.65	—	nC	V _{DS} = 30V, I _D = 1.8A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	3.2	—		
Gate-Source Charge	Q _{gs}	—	0.67	—		
Gate-Drain Charge	Q _{gd}	—	0.82	—		
Turn-On Delay Time	t _{D(on)}	—	1.8	—	ns	V _{DD} = 30V, V _{GS} = 10V, I _D = 1.8A, R _G = 6.0Ω
Turn-On Rise Time	t _r	—	1.4	—		
Turn-Off Delay Time	t _{D(off)}	—	4.9	—		
Turn-Off Fall Time	t _f	—	2.0	—		
Reverse Recovery Time	t _{rr}	—	20.5	—	ns	T _J = +25°C, I _S = 1.8A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{rr}	—	21.3	—	nC	

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

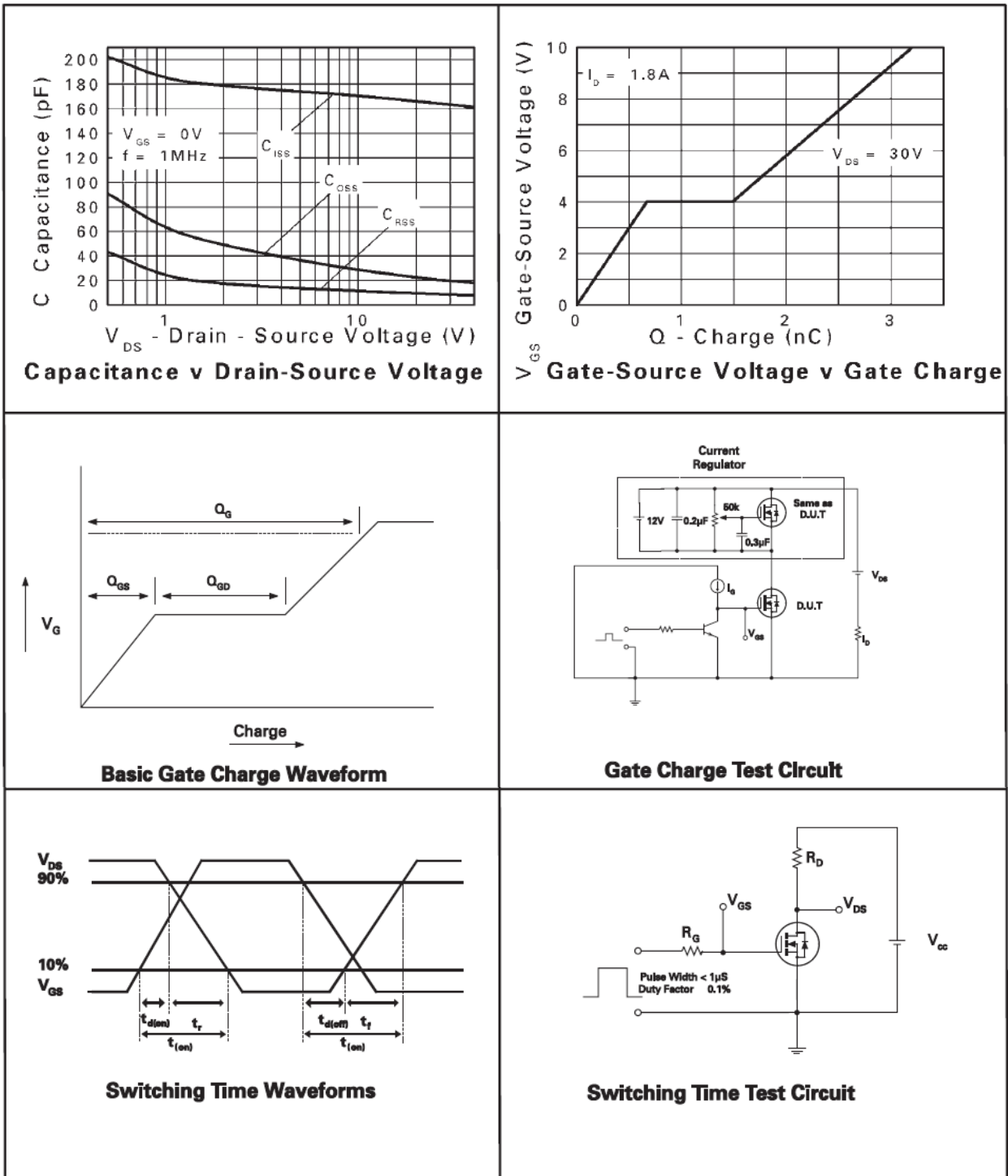
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 10)						
Drain-Source Breakdown Voltage	BV _{DSS}	-60	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	V _{DS} = -60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 10)						
Gate Threshold Voltage	V _{GS(th)}	-1.0	—	—	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance (Note 9)	R _{DS(ON)}	—	—	0.425	Ω	V _{GS} = -10V, I _D = -0.9A
		—	—	0.63		V _{GS} = -4.5V, I _D = -0.8A
Forward Transfer Admittance (Notes 9 & 11)	g _{fs}	—	1.8	—	S	V _{DS} = -15V, I _D = -0.9A
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.85	-0.95	V	T _J = +25°C, V _{GS} = 0V, I _S = -0.8A
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C _{iss}	—	233	—	pF	V _{DS} = -30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	17.4	—		
Reverse Transfer Capacitance	C _{rss}	—	9.6	—		
Gate Charge (V _{GS} = -5.0V)	Q _g	—	2.4	—	nC	V _{DS} = -30V, I _D = -0.9A,
Total Gate Charge (V _{GS} = -10V)	Q _g	—	5.1	—		
Gate-Source Charge	Q _{gs}	—	0.7	—		
Gate-Drain Charge	Q _{gd}	—	0.7	—		
Turn-On Delay Time	t _{D(on)}	—	1.6	—	ns	V _{DD} = -30V, V _{GS} = -10V, R _G = 6.0Ω, I _D = -1.0A
Turn-On Rise Time	t _r	—	2.3	—		
Turn-Off Delay Time	t _{D(off)}	—	13	—		
Turn-Off Fall Time	t _f	—	5.8	—		
Reverse Recovery Time	t _{rr}	—	22.6	—	ns	T _J = +25°C, I _S = -0.9A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{rr}	—	23.2	—	nC	

Notes: 9. Measured under pulsed conditions. Width ≤ 300μs. Duty cycle ≤ 2%.
 10. Short duration pulse test used to minimize self-heating effect.
 11. Guaranteed by design. Not subject to product testing.

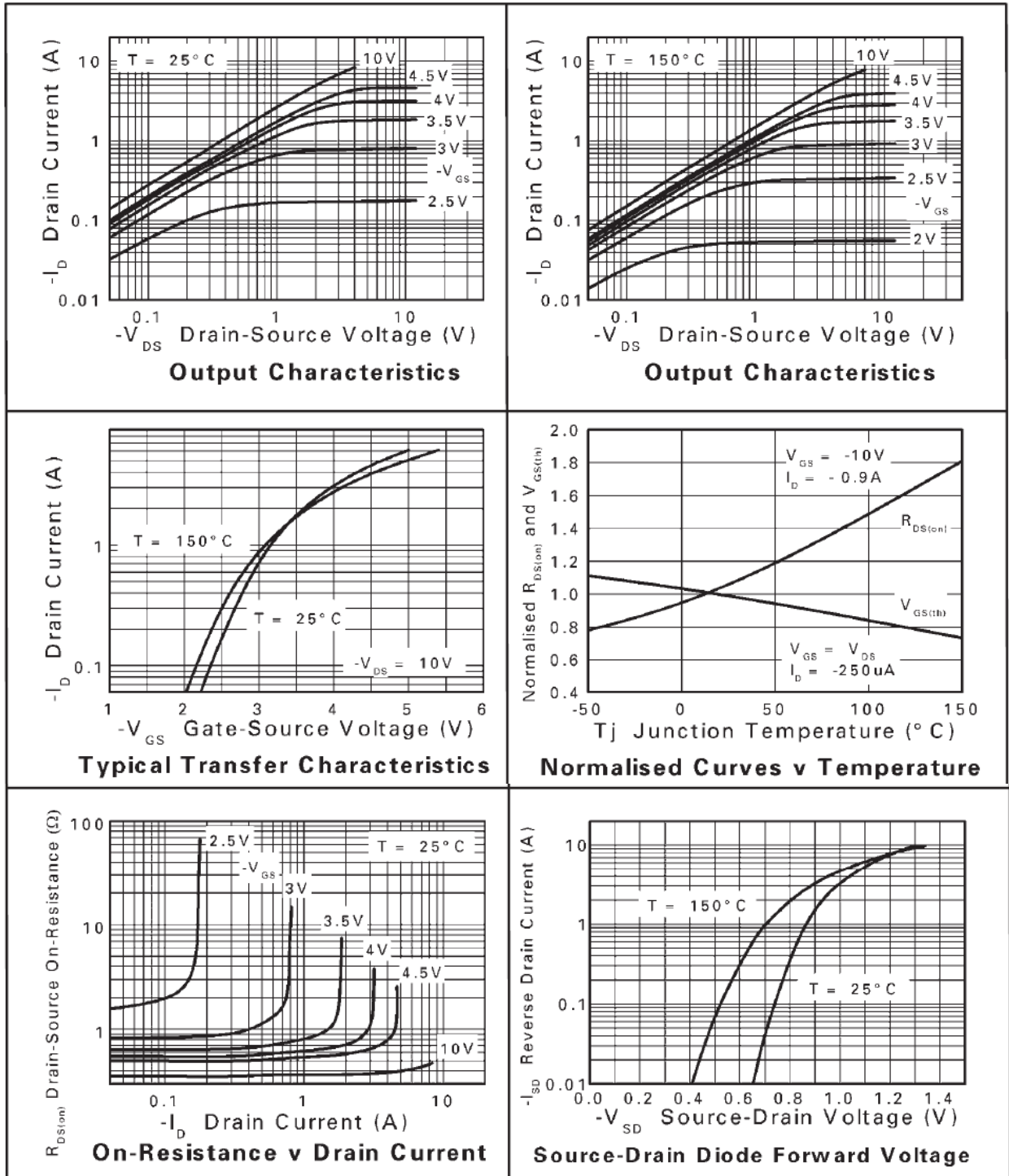
Typical Characteristics (N-Channel)



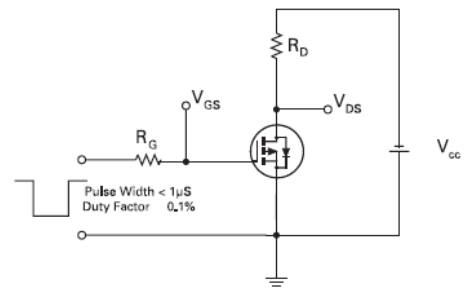
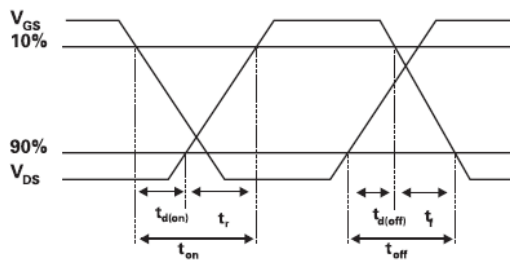
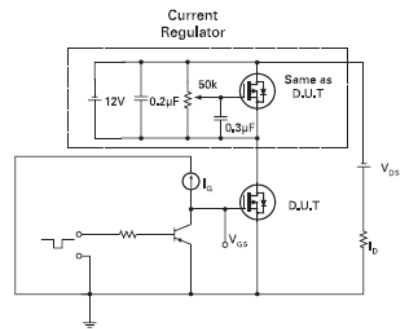
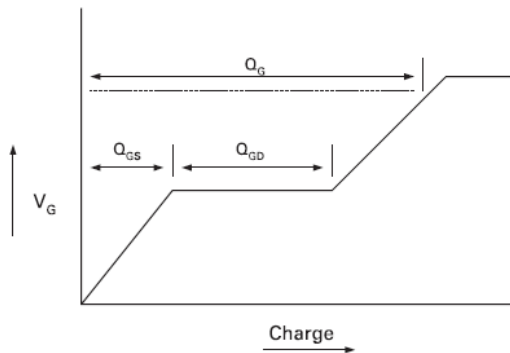
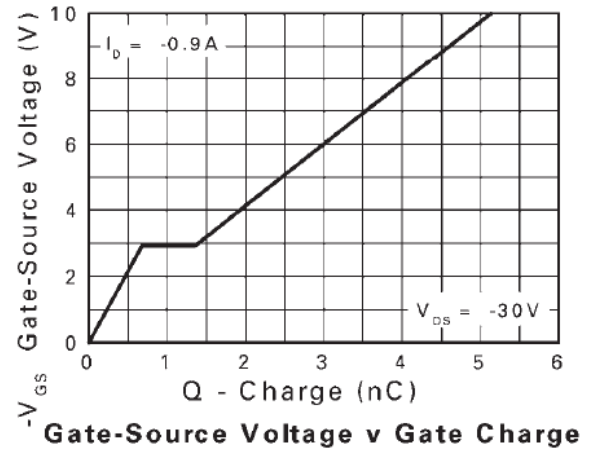
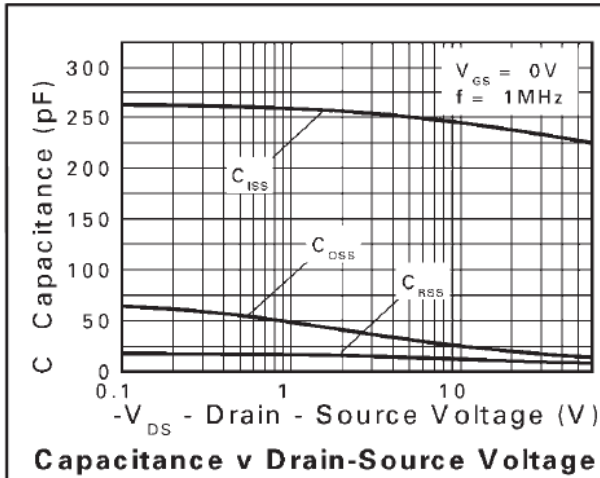
Typical Characteristics (N-Channel)



Typical Characteristics (P-Channel)

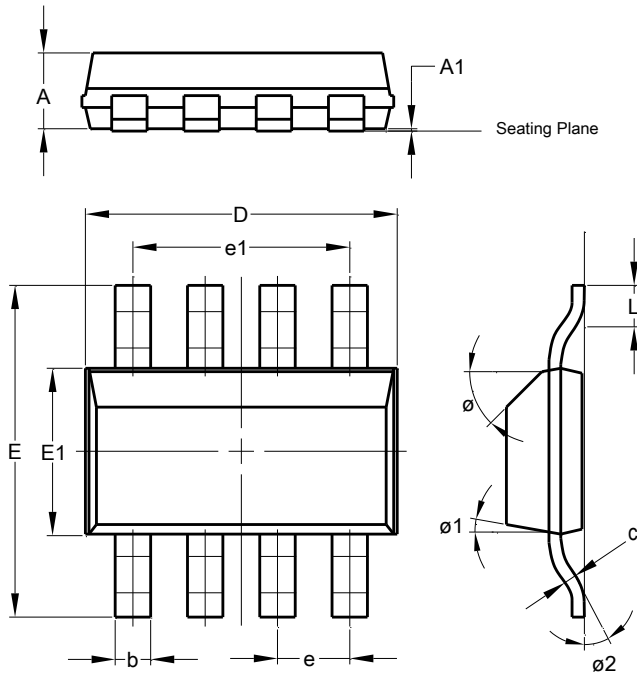


Typical Characteristics (P-Channel)



Package Outline Dimensions

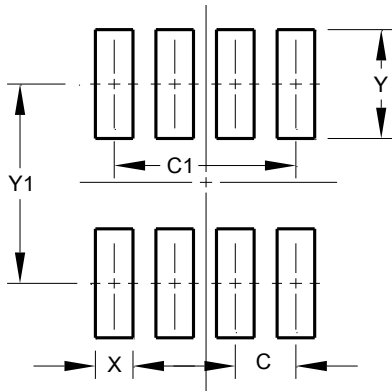
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SM-8			
Dim	Min	Max	Typ
A	--	1.70	1.60
A1	0.02	0.10	0.04
b	0.70	0.90	0.80
c	0.24	0.32	0.28
D	6.30	6.70	6.60
e	1.53 REF		
e1	4.59 REF		
E	6.70	7.30	7.00
E1	3.30	3.70	3.50
L	0.75	1.00	0.90
ø	--	--	45°
ø1	--	15°	--
ø2	--	--	10°
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	1.52
C1	4.60
X	0.95
Y	2.80
Y1	6.80

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