

COMPLEMENTARY 100V ENHANCEMENT MODE MOSFET H-BRIDGE
Product Summary

| Device | BV _{DSS} | R _{DS(ON)} max | I _D max T _A = +25°C |
|-----------|-------------------|-------------------------------|--|
| N-Channel | 100V | 0.7Ω @ V _{GS} = 10V | 1.4A |
| | | 0.9Ω @ V _{GS} = 6V | 1.1A |
| P-Channel | -100V | 1.0Ω @ V _{GS} = -10V | -1.3A |
| | | 1.45Ω @ V _{GS} = -6V | -0.9A |

Description

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

Applications

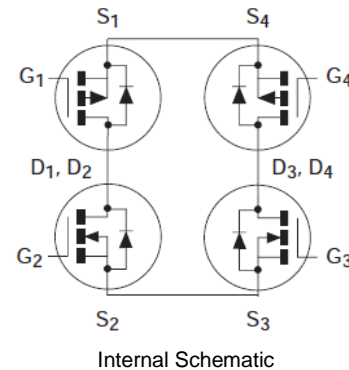
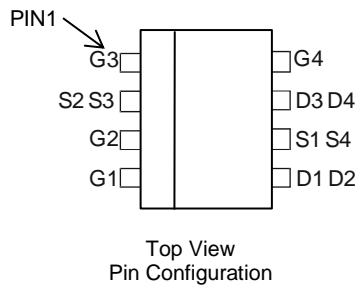
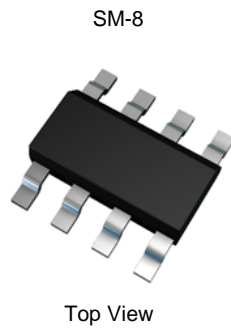
- DC Motor Control
- DC-AC Inverters

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)**

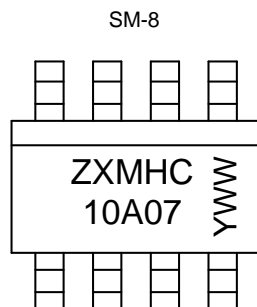
Mechanical Data

- 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 Ⓢ
- Weight: 0.117 grams (Approximate)


Ordering Information (Note 4)

| Part Number | Reel Size | Tape Width | Quantity per Reel |
|----------------|-----------|------------|-------------------|
| ZXMHC10A07T8TA | 7" | 12mm | 1,000 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


ZXMHC10A07 = 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°C, unless otherwise specified.)

| Characteristic | | Symbol | N-channel | P-channel | Units | |
|--|--------------|------------------|---------------------------------|-----------|-------|---|
| Drain-Source Voltage | | V _{DSS} | 100 | -100 | V | |
| Gate-Source Voltage | | V _{GSS} | ±20 | ±20 | V | |
| Continuous Drain Current, V _{GS} = 10V (Note 8) | Steady State | I _D | T _A = +25°C (Note 6) | 1.1 | -0.9 | A |
| | | | T _A = +70°C (Note 6) | 0.9 | -0.8 | |
| | | | T _A = +25°C (Note 5) | 1.0 | -0.8 | |
| Maximum Body Diode Forward Current (Note 6) | | I _S | 2.3 | -2.2 | A | |
| Pulsed Drain Current (Note 7) | | I _{DM} | 5.2 | -4.5 | A | |
| Pulsed Source Current (Note 7) | | I _{SM} | 5.2 | -4.5 | A | |

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

| Characteristic | | Symbol | Value | Units |
|--|---------------------------------|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 8) | T _A = +25°C (Note 5) | P _D | 1.3 | W |
| Linear Derating Factor | | | 10.4 | mW/°C |
| Total Power Dissipation (Note 8) | T _A = +25°C (Note 6) | P _D | 1.3 | W |
| Linear Derating Factor | | | 10.4 | mW/°C |
| Thermal Resistance, Junction to Ambient (Note 8) | Steady State (Note 5) | R _{θJA} | 94.5 | °C/W |
| | Steady State (Note 6) | | 73.3 | °C/W |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

- Notes:
5. 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.
 6. For a device surface mounted on FR4 PCB measured at t ≤ 10 seconds.
 7. Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, D = 0.02, pulse width 300µs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.
 8. For device with one active die.

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

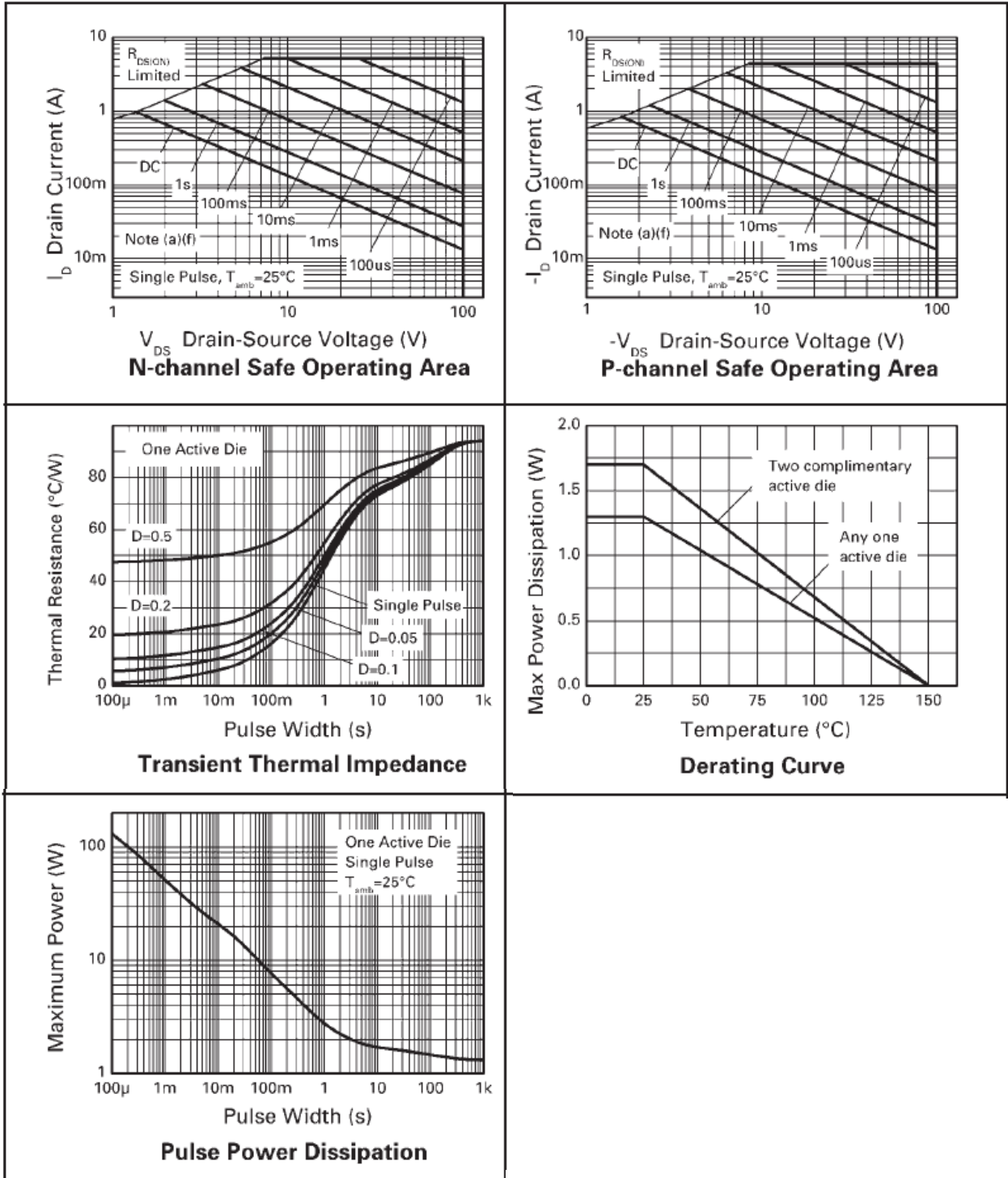
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-----|------|------|---|
| OFF CHARACTERISTICS (Note 10) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 100 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1.0 | μA | V _{DS} = 100V, 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)} | 2.0 | — | 4.0 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance (Note 9) | R _{DS(ON)} | — | — | 0.7 | Ω | V _{GS} = 10V, I _D = 1.5A |
| | | — | — | 0.9 | | V _{GS} = 6.0V, I _D = 1.0A |
| Forward Transfer Admittance (Notes 9 & 11) | g _{fs} | — | 1.6 | — | S | V _{DS} = 15V, I _D = 1.0A |
| Diode Forward Voltage (Note 9) | V _{SD} | — | — | 0.95 | V | V _{GS} = 0V, I _S = 1.5A |
| DYNAMIC CHARACTERISTICS (Note 11) | | | | | | |
| Input Capacitance | C _{iss} | — | 138 | — | pF | V _{DS} = 60V, V _{GS} = 0V, f = 1MHz |
| Output Capacitance | C _{oss} | — | 12 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 6 | — | | |
| Total Gate Charge | Q _g | — | 2.9 | — | nC | V _{DS} = 50V, I _D = 1.0A, V _{GS} = 10V |
| Gate-Source Charge | Q _{gs} | — | 0.7 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 1.0 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 1.8 | — | ns | V _{DD} = 50V, V _{GS} = 10V, I _D = 1.0A, R _G = 6.0Ω |
| Turn-On Rise Time | t _R | — | 1.5 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 4.1 | — | | |
| Turn-Off Fall Time | t _F | — | 2.1 | — | | |
| Reverse Recovery Time | t _{RR} | — | 27 | — | ns | I _S = 1.8A, di/dt = 100A/μs |
| Reverse Recovery Charge | Q _{rr} | — | 12 | — | nC | |

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

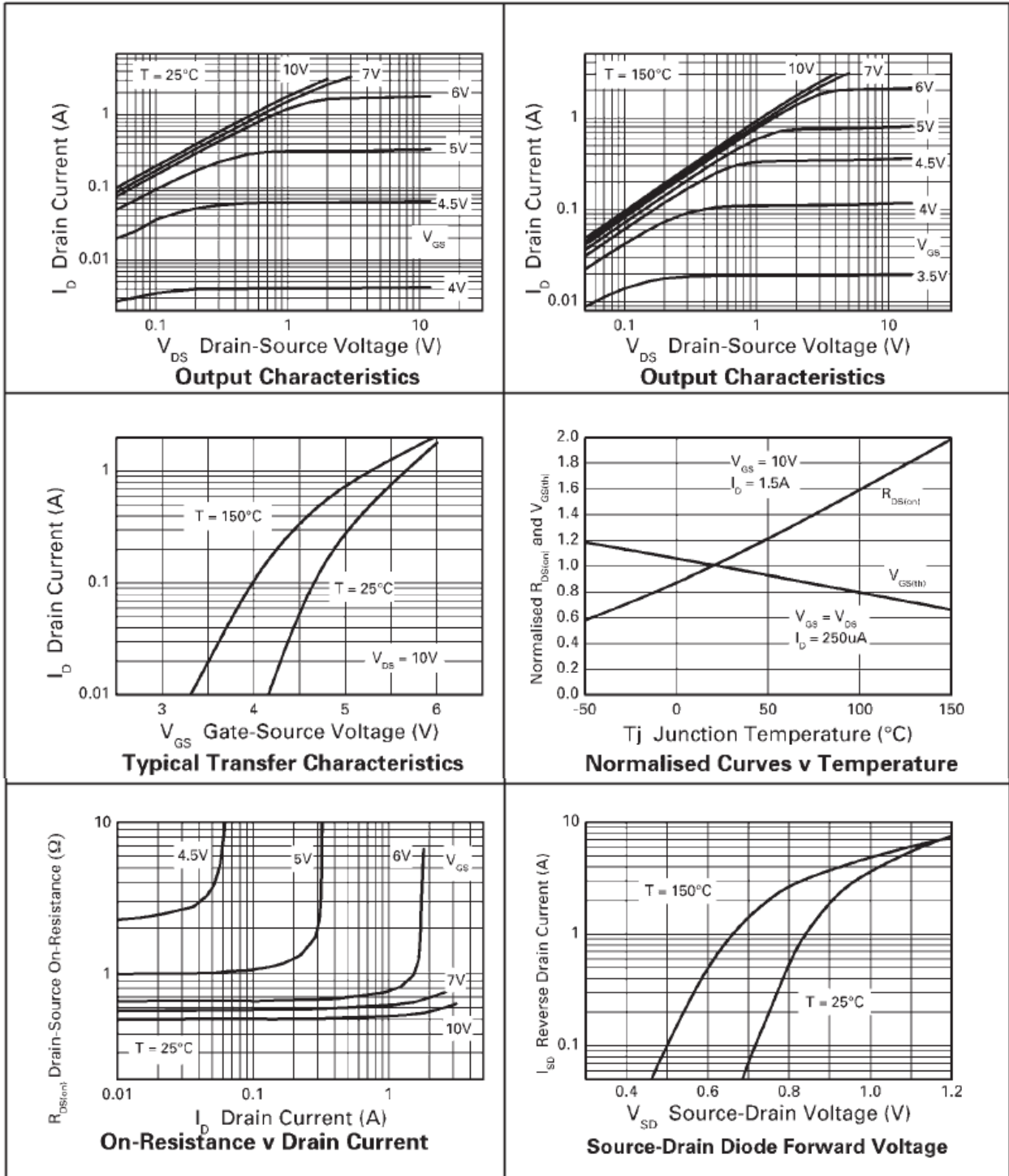
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|------|-------|-------|------|--|
| OFF CHARACTERISTICS (Note 10) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -100 | — | — | V | V _{GS} = 0V, I _D = -250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1.0 | μA | V _{DS} = -100V, 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)} | -2.0 | — | -4.0 | V | V _{DS} = V _{GS} , I _D = -250μA |
| Static Drain-Source On-Resistance (Note 9) | R _{DS(ON)} | — | — | 1.0 | Ω | V _{GS} = -10V, I _D = -0.6A |
| | | — | — | 1.45 | | V _{GS} = -6.0V, I _D = -0.5A |
| Forward Transfer Admittance (Notes 9 & 11) | g _{fs} | — | 1.2 | — | S | V _{DS} = -15V, I _D = -0.6A |
| Diode Forward Voltage (Note 9) | V _{SD} | — | -0.85 | -0.95 | V | V _{GS} = 0V, I _S = -0.75A |
| DYNAMIC CHARACTERISTICS (Note 11) | | | | | | |
| Input Capacitance | C _{iss} | — | 141 | — | pF | V _{DS} = -50V, V _{GS} = 0V, f = 1MHz |
| Output Capacitance | C _{oss} | — | 13.1 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 10.8 | — | | |
| Gate Charge (V _{GS} = -5.0V) | Q _g | — | 1.6 | — | nC | V _{DS} = -50V, I _D = -0.6A |
| Total Gate Charge (V _{GS} = -10V) | Q _g | — | 3.5 | — | | |
| Gate-Source Charge | Q _{gs} | — | 0.6 | — | | |
| Gate-Drain Charge | Q _{gd} | — | 1.6 | — | nC | V _{DD} = -50V, V _{GS} = -10V, R _G = 6.0Ω, I _D = -1.0A |
| Turn-On Delay Time | t _{D(ON)} | — | 1.6 | — | | |
| Turn-On Rise Time | t _R | — | 2.1 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 5.9 | — | ns | I _S = -0.9A, di/dt = 100A/μs |
| Turn-Off Fall Time | t _F | — | 3.3 | — | | |
| Reverse Recovery Time | t _{RR} | — | 29 | — | ns | |
| Reverse Recovery Charge | Q _{rr} | — | 31 | — | 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.

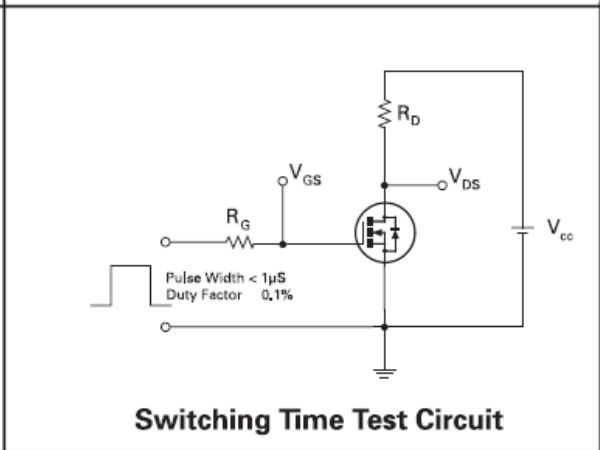
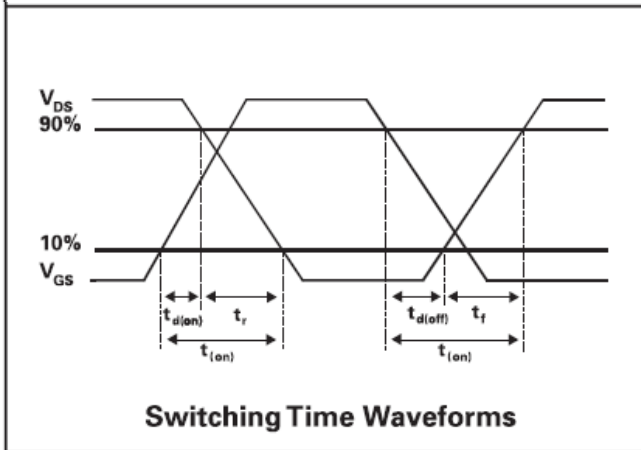
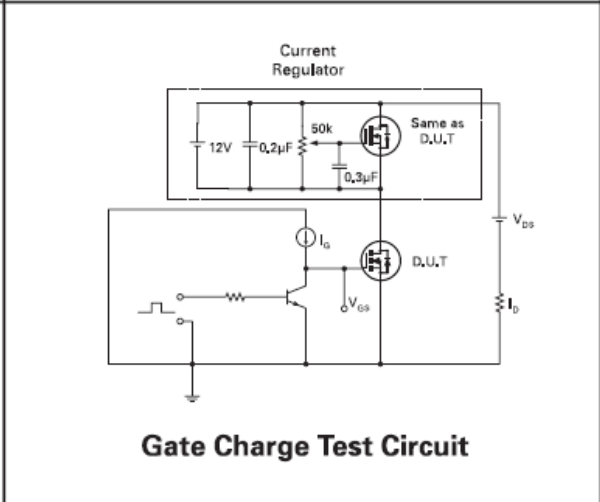
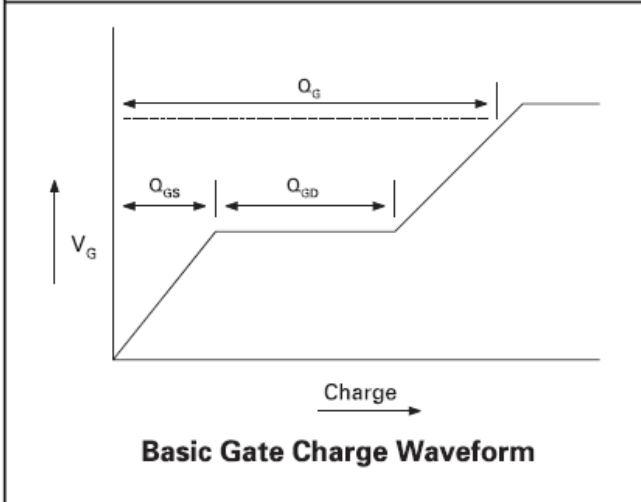
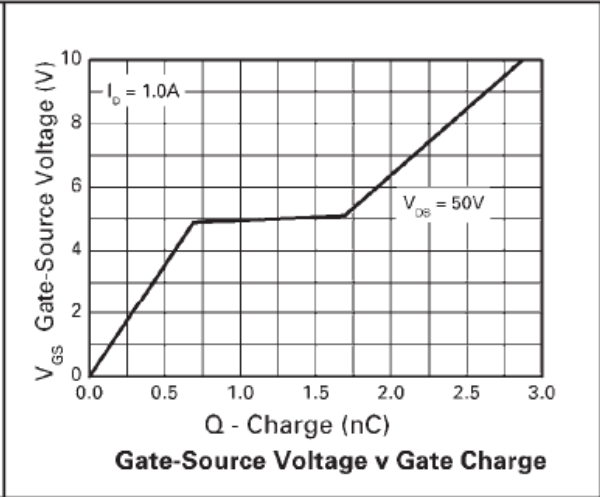
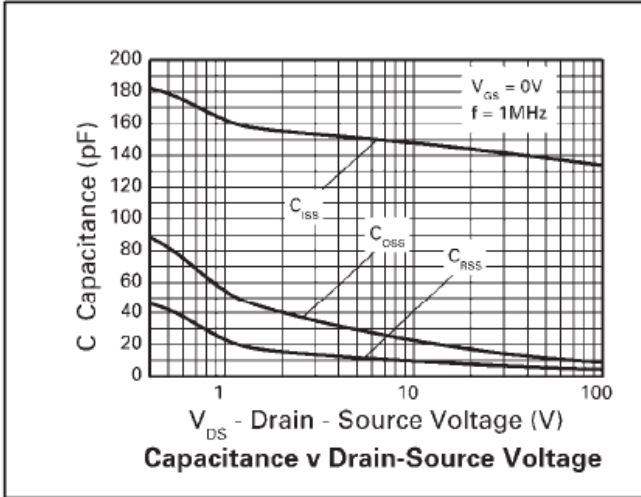
Typical Characteristics



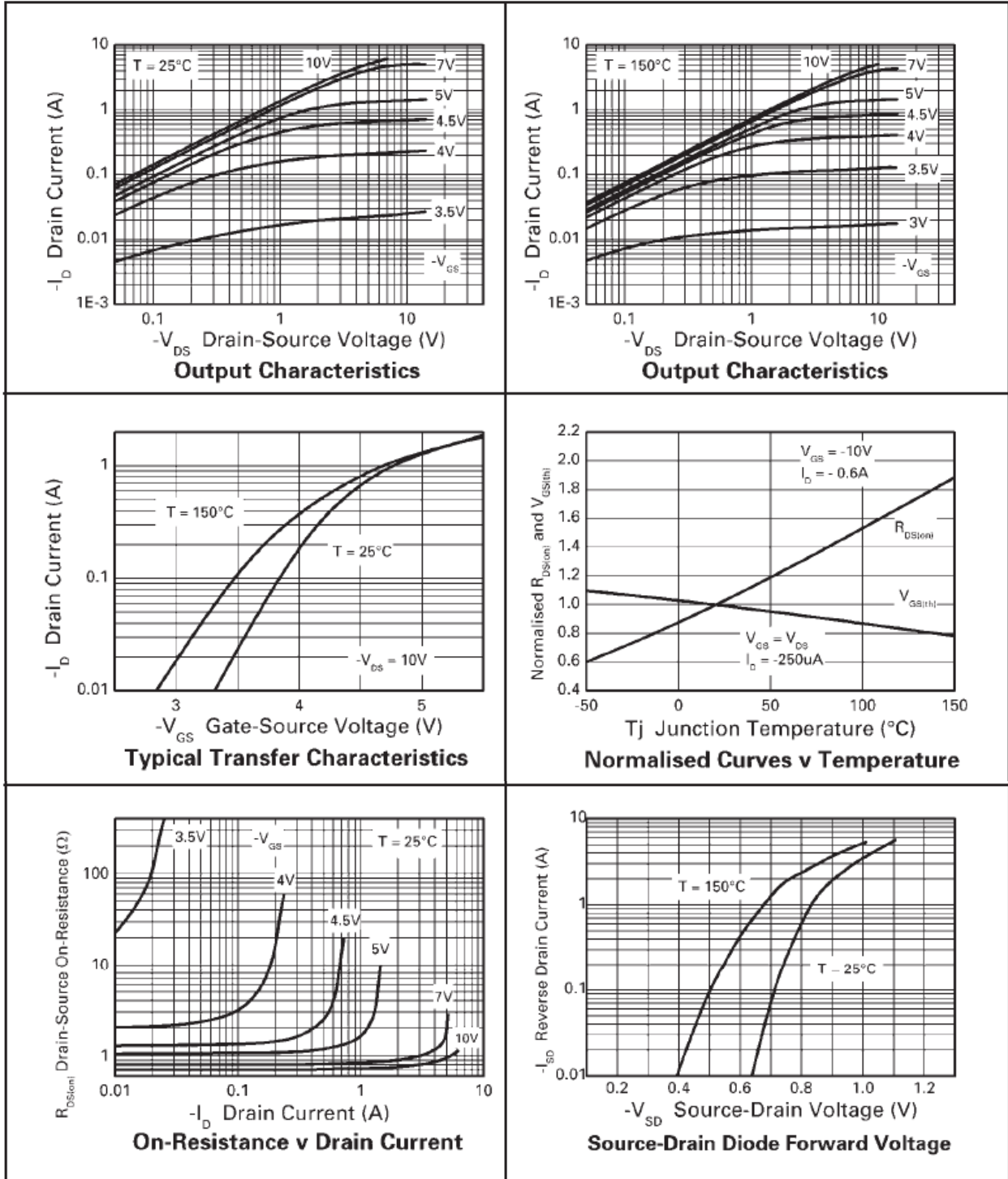
Typical Characteristics (N-Channel)



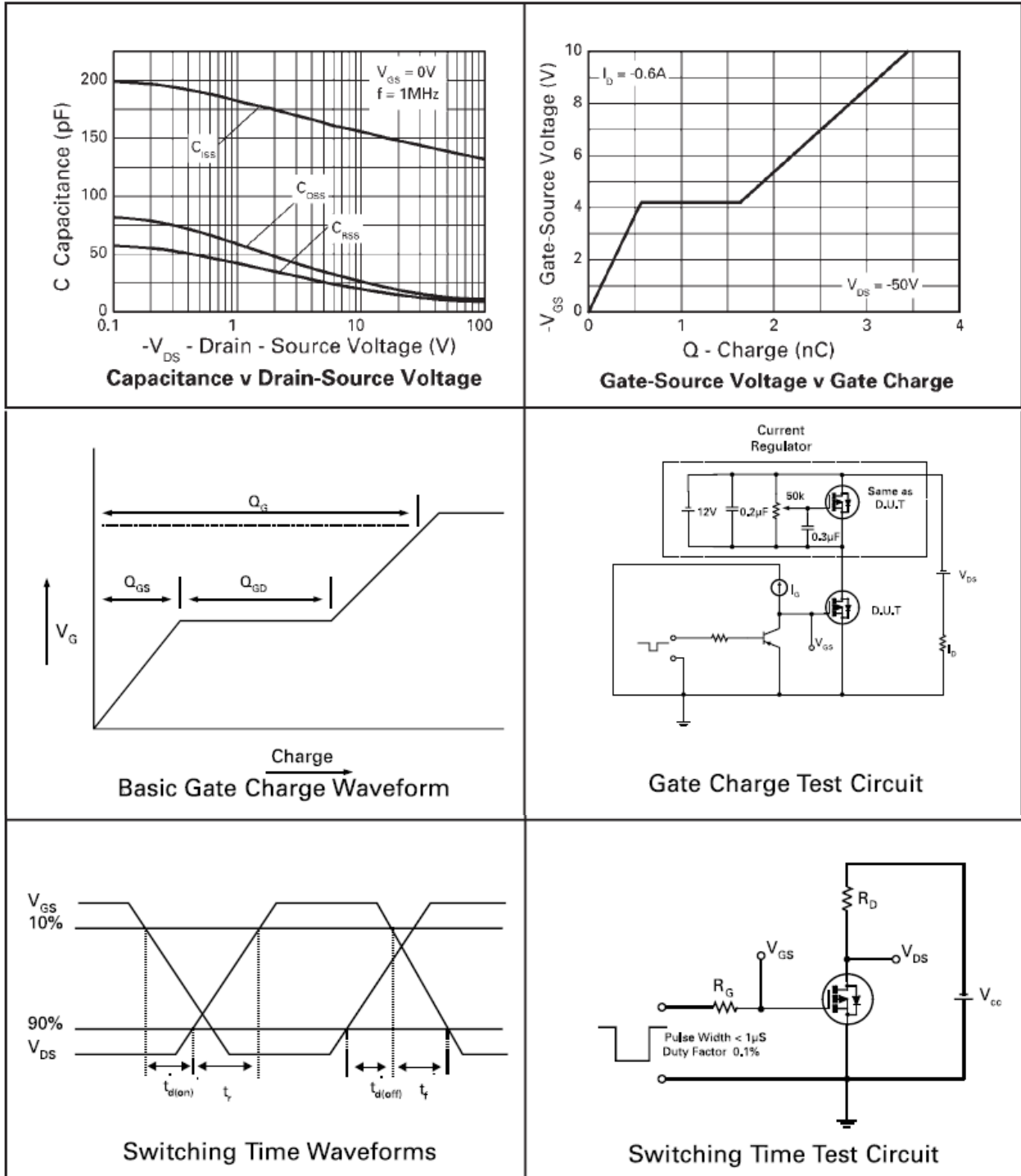
Typical Characteristics (N-Channel) (Cont.)



Typical Characteristics (P-Channel)

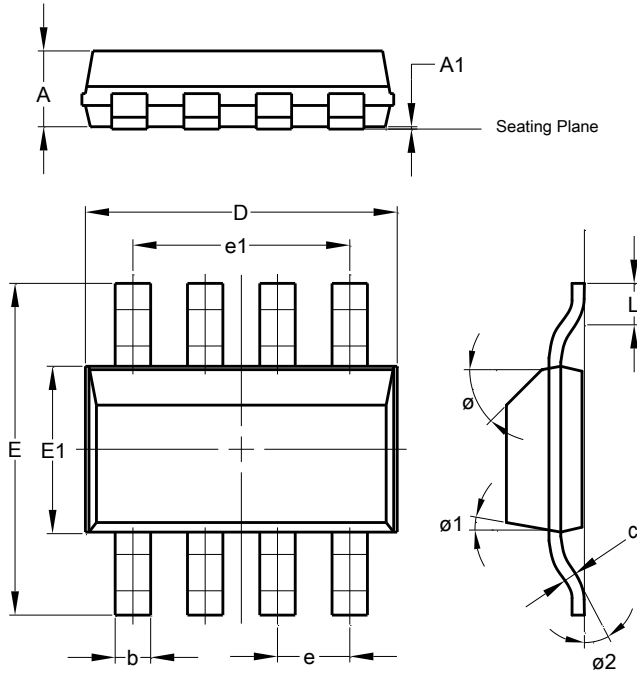


Typical Characteristics (P-Channel) (Cont.)



Package Outline Dimensions

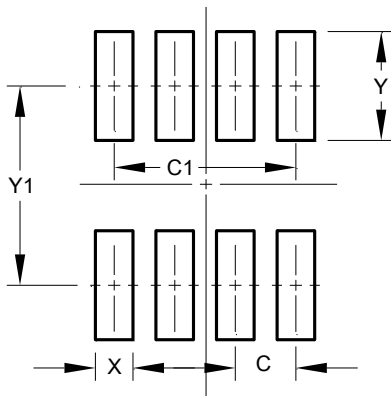
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| 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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