# MS44N60T

## N-Channel 60-V (D-S) MOSFET

### Features

- Low rDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

### Applications

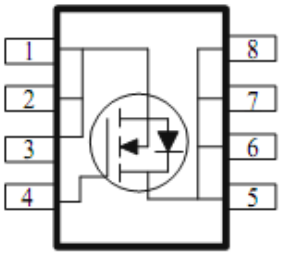
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

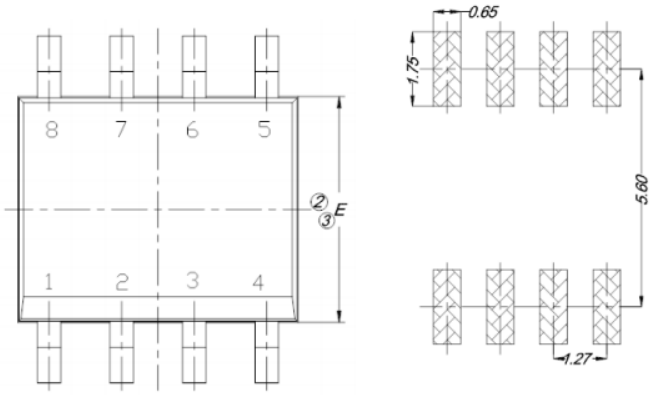
### Packing & Order Information

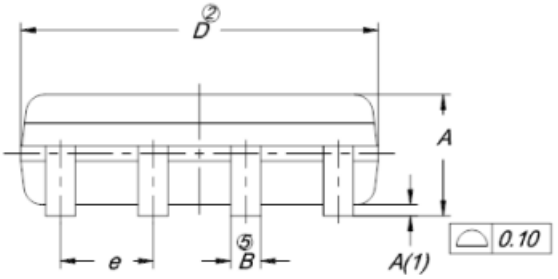
3,000/Reel

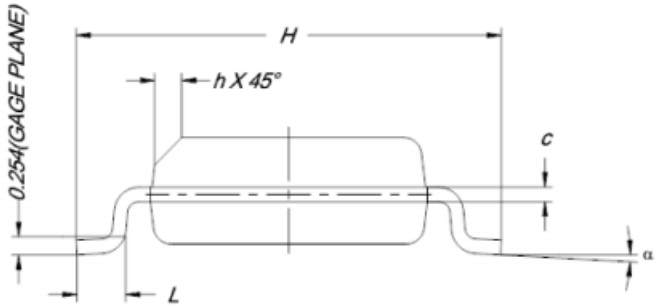
**RoHS**
COMPLIANT

### Graphic symbol




| DIM. | MILLIMETERS | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 1.35 | 1.55 | 1.75 |
| A(1) | 0.10 | 0.18 | 0.25 |
| B | 0.38 | 0.45 | 0.51 |
| C | 0.19 | 0.22 | 0.25 |
| D | 4.80 | 4.90 | 5.00 |
| E | 3.80 | 3.90 | 4.00 |
| e | 1.27 BSC | | |
| H | 5.80 | 6.00 | 6.20 |
| L | 0.50 | 0.72 | 0.93 |
| α | 0° | 4° | 8° |
| h | 0.25 | 0.38 | 0.50 |

# MS44N60T

## N-Channel 60-V (D-S) MOSFET

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

**Absolute Maximum Ratings ($T_A$=25°C unless otherwise specified)**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 60 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$ | Continuous Drain Current[a] ($T_A$ =25°C) | 6.4 | A |
| | Continuous Drain Current[a] ($T_A$ =70°C) | 5.4 | A |
| $I_{DM}$ | Pulsed Drain Current[b] | 30 | A |
| $I_S$ | Continuous Source Current (Diode Conduction)[a] | 4 | A |
| $P_D$ | Power Dissipation[a] ($T_A$ =25°C) | 3.1 | W |
| | Power Dissipation[a] ($T_A$ =70°C) | 2.2 | W |
| $T_J/T_{STG}$ | Operating Junction and Storage Temperature | -55 to +150 | °C |

**THERMAL RESISTANCE RATINGS**

| Symbol | Parameter | Maximum | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Maximum Junction-to-Ambient[a] (t <= 10 sec) | 40 | °C/W |
| | Maximum Junction-to-Ambient[a] (Steady-State) | 80 | |

**Notes:**

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

**Static**

| Symbol | Parameter | Test Conditions | Min | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $V_{GS(th)}$ | Gate-Threshold Voltage | $V_{DS}$ = $V_{GS}$ , $I_D$ = 250μA | 1 | | | V |
| $I_{GSS}$ | Gate-Body Leakage | $V_{DS}$ = 0 V , $V_{GS}$ = ±20 V | | | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 48 V , $V_{GS}$ = 0 V<br>$V_{DS}$ = 48 V , $V_{GS}$ = 0 V , $T_J$= 55°C | | | 1<br>25 | uA |
| $I_{D(on)}$ | On-State Drain Current | $V_{DS}$ = 5 V , $V_{GS}$ = 10 V | 10 | | | A |
| $r_{DS(on)}$ | Drain-Source On-Resistance | $V_{GS}$ = 10 V , $I_D$ = 5.1 A<br>$V_{GS}$ = 4.5 V , $I_D$ = 5 A | | | 50<br>60 | mΩ |
| $g_{fs}$ | Forward Tranconductance | $V_{DS}$ = 15 V , $I_D$ = 5.1 A | | 40 | | S |
| $V_{SD}$ | Diode Forward Voltage | $I_S$ = 2 A , $V_{GS}$ = 0 V | | 0.77 | | V |

**Dynamic[b]**

| Symbol | Parameter | Test Conditions | Min | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $Q_g$ | Total Gate Charge | $V_{DS}$ = 30 V , $I_D$ = 5.1 A , $V_{GS}$ = 4.5 V | -- | 3.8 | -- | nC |
| $Q_{gs}$ | Gate-Source Charge | | -- | 1.6 | -- | nC |
| $Q_{gd}$ | Gate-Drain Charge | | -- | 1.4 | -- | nC |

# MS44N60T

N-Channel 60-V (D-S) MOSFET

| Dynamic[b] | | | | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Parameter** | **Test Conditions** | **Min** | **Typ.** | **Max.** | **Units** |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$ = 30 V , $R_L$ = 5.9 Ω , $V_{GEN}$ = 10 V , $I_D$ = 5.1 A $R_{GEN}$ = 6 Ω , | -- | 3 | -- | ns |
| $t_r$ | Rise Time | | -- | 4 | -- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | -- | 18 | -- | ns |
| tf | Fall Time | | -- | 5 | -- | ns |
| $C_{ISS}$ | Input Capacitance | $V_{GS}$ = 0 V , $V_{DS}$ = 15 V , f = 1MHz | -- | 382 | -- | pF |
| $C_{OSS}$ | Output Capacitance | | -- | 58 | -- | pF |
| $C_{RSS}$ | Reverse Transfer Capacitance | | -- | 32 | -- | pF |

**Notes:**

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

# MS44N60T

## N-Channel 60-V (D-S) MOSFET

■Typical Electrical Characteristics

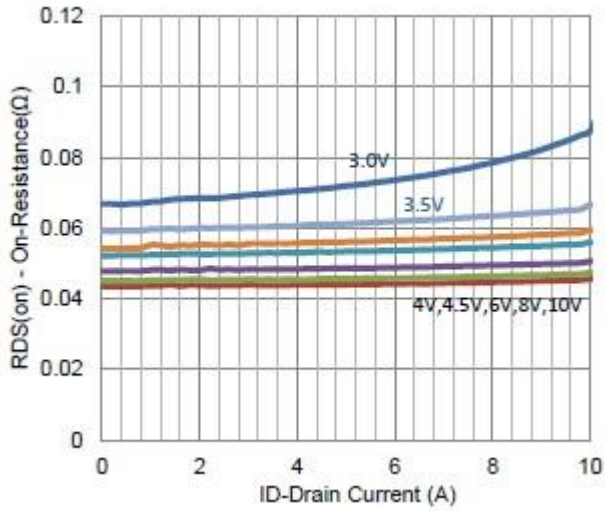



**FIG.1-ON-RESISTANCE VS. DRAIN CURRENT**

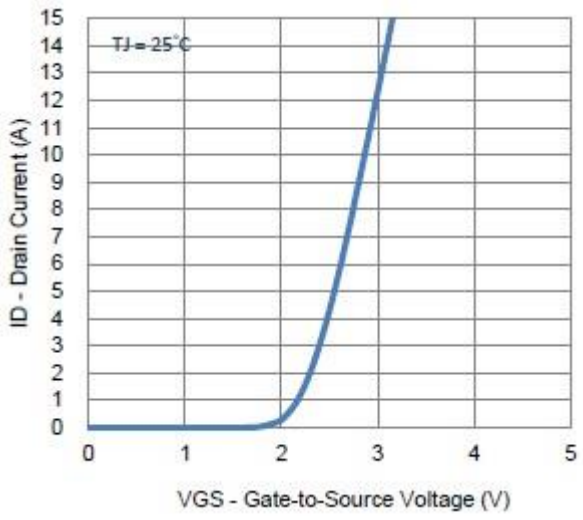



**FIG.2-TRANSFER CHARACTERISTICS**

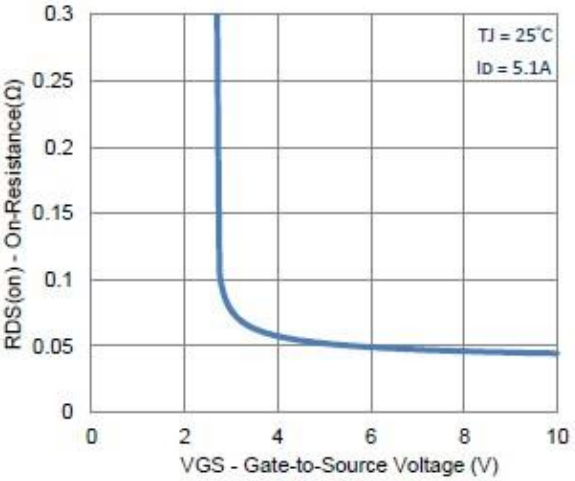



**FIG.3- ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE**

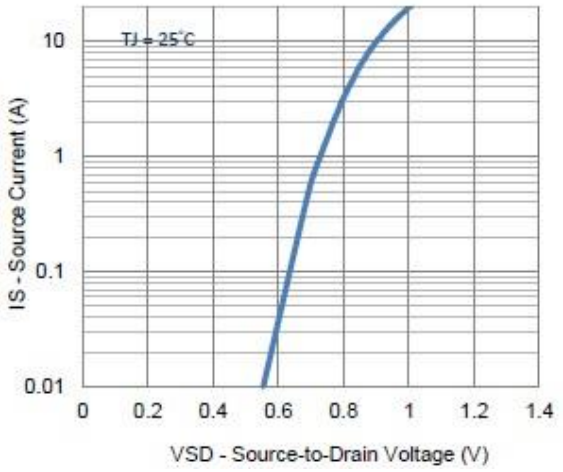



**FIG.4-DRAIN-TO SOURCE FORWARD WOLTAGE**

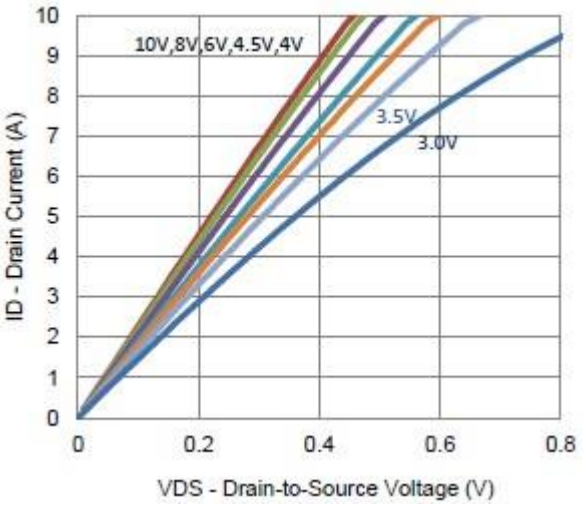



**FIG.5-OUTPUT CHARACTERISTICS**

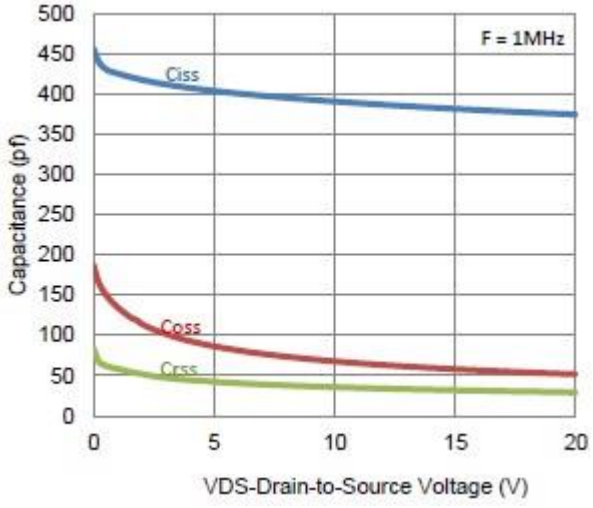



**FIG.6-CAPACITANCE**

# MS44N60T

N-Channel 60-V (D-S) MOSFET

■Typical Electrical Characteristics

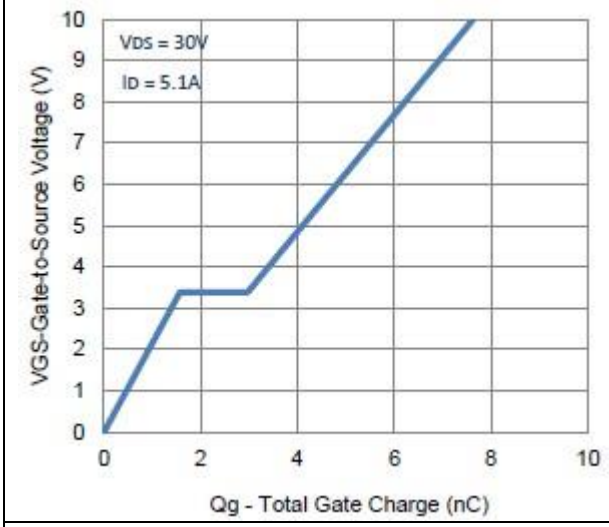



**FIG.7-GATE CHARGE**

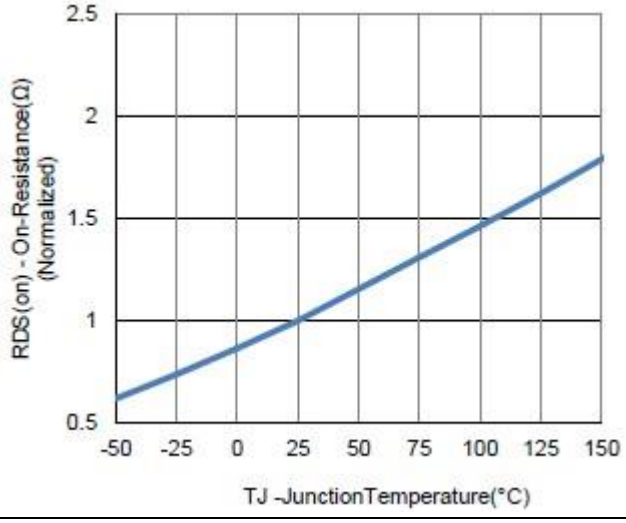



**FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE**

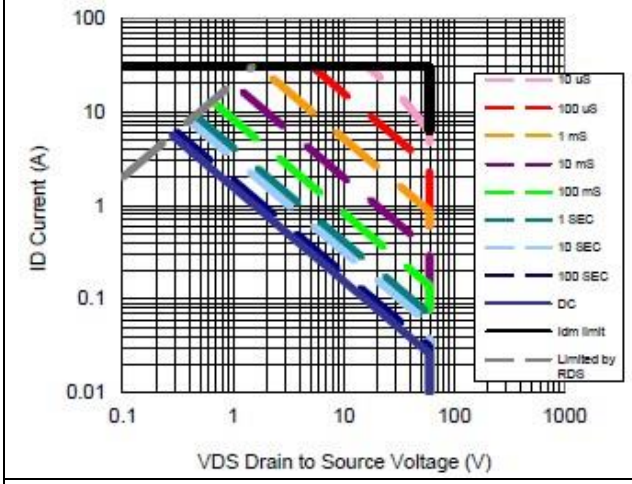



**FIG.9-SAFE OPERATING AREA**

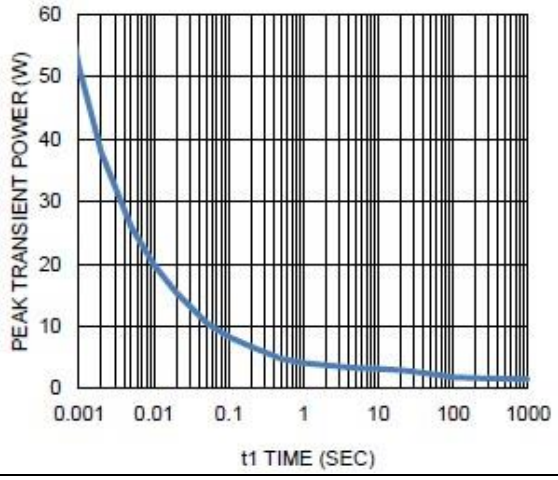



**FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION**

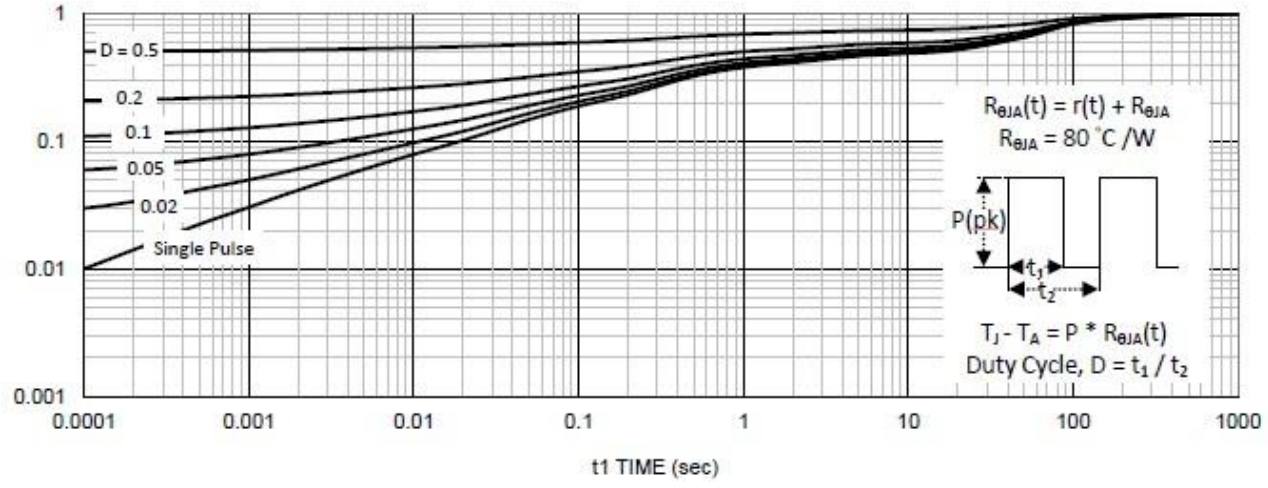



**FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT**

# MS44N60T

N-Channel 60-V (D-S) MOSFET

**Disclaimer**

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Bruckewell”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

(i) Any and all liability arising out of the application or use of any product.

(ii) Any and all liability, including without limitation special, consequential or incidental damages.

(iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell’s knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell’s terms and conditions of purchase, including but not limited to the warranty expressed therein.