## N-Channel 150V (D-S) MOSFET

### GENERAL DESCRIPTION

The ME2612 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching, and low in-line power loss are needed in a very small outline surface mount package.
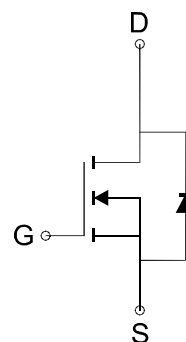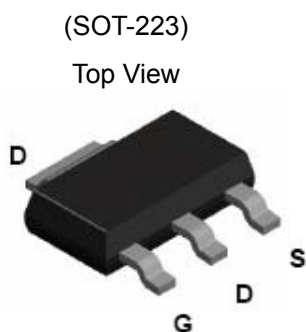
### FEATURES

● $R_{DS(ON)} \leqq 375m\Omega@V_{GS}=10V$

● $R_{DS(ON)} \leqq 390m\Omega@V_{GS}=4.5V$

● Super high density cell design for extremely low $R_{DS(ON)}$

● Exceptional on-resistance and maximum DC current capability

### APPLICATIONS

● DC/DC Converter
● Load Switch

### PIN   CONFIGURATION

(SOT-223)

Top View



Ordering Information: ME2612 (Pb-free)

ME2612-G (Green product-Halogen free )

N-Channel MOSFET

### Absolute Maximum Ratings (T$_A$=25℃ Unless Otherwise Noted)

| Parameter | | Symbol | Maximum Ratings | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | V$_{DS}$ | 150 | V |
| Gate-Source Voltage | | V$_{GS}$ | ±20 | V |
| Continuous Drain Current | T$_A$=25℃ | I$_D$ | 2.2 | A |
| | T$_A$=70℃ | | 1.7 | |
| Pulsed Drain Current | | I$_{DM}$ | 9 | A |
| Maximum Power Dissipation | T$_A$=25℃ | P$_D$ | 2.9 | W |
| | T$_A$=70℃ | | 1.9 | |
| Operating Junction Temperature | | T$_J$ | 150 | ℃ |
| Storage Temperature Range | | Tstg | -55 to 150 | ℃ |
| Thermal Resistance-Junction to Ambient | | R$_{θJA}$ | 42 | ℃/W |

*The device mounted on 1in$^2$ FR4 board with 2 oz copper

## N-Channel 150V (D-S) MOSFET

**Electrical Characteristics** ($T_A$ =25℃ Unless Otherwise Specified)

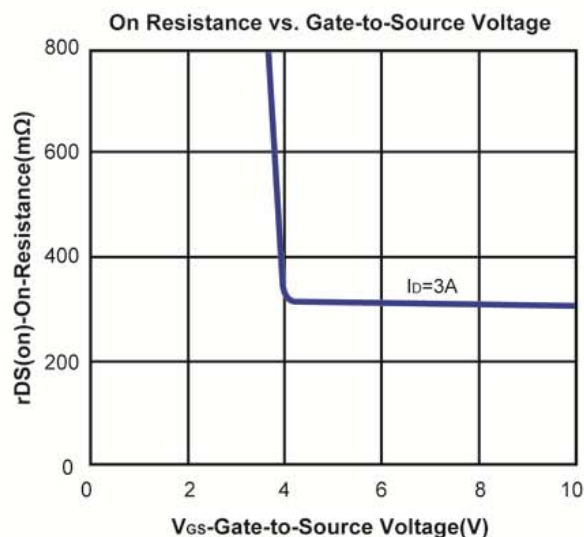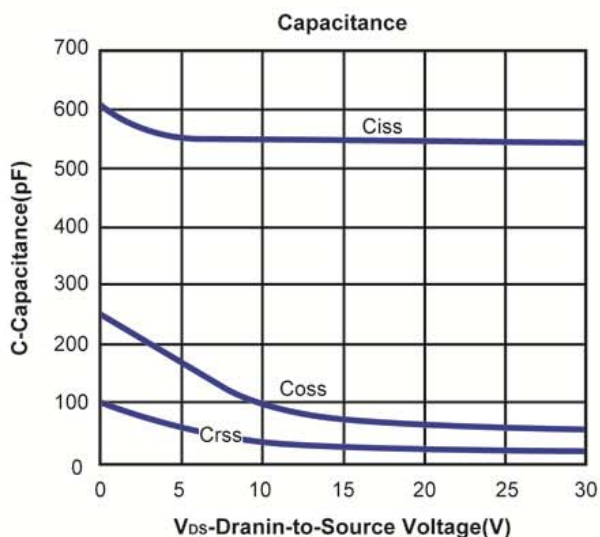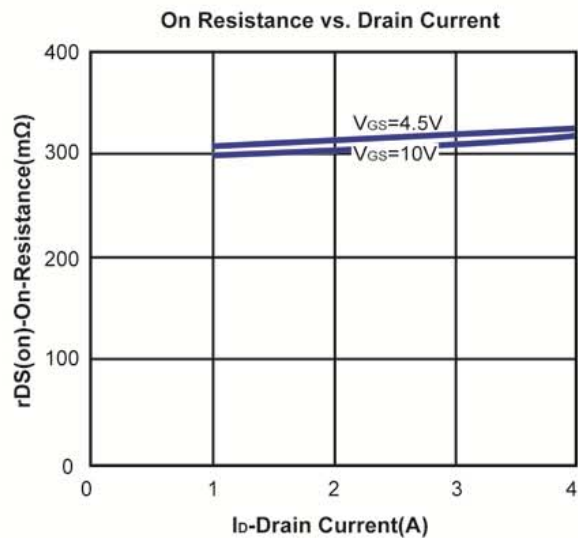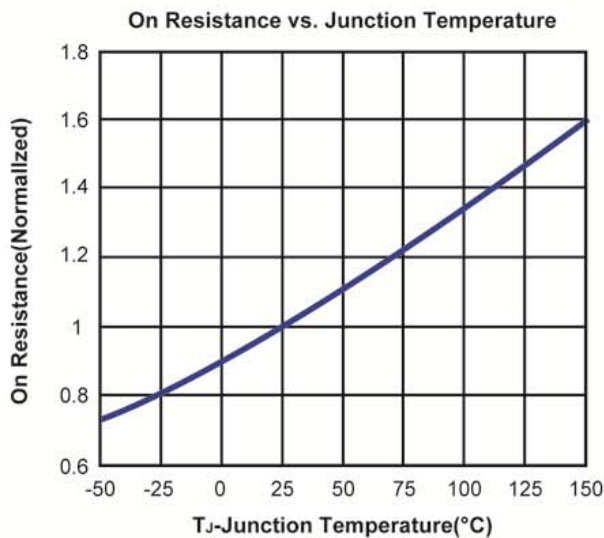| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| $V_{BR(DSS)}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250$\mu$A | 150 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250$\mu$A | 1.0 | | 3.0 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=120V, $V_{GS}$=0V | | | 1 | $\mu$A |
| $R_{DS(ON)}$ | Drain-Source On-Resistance[a] | $V_{GS}$=10V, $I_D$= 3A | | 310 | 375 | m$\Omega$ |
| | | $V_{GS}$=4.5V, $I_D$=2A | | 310 | 390 | |
| $V_{SD}$ | Diode Forward Voltage | $I_S$=2.5A, $V_{GS}$=0V | | 0.8 | 1.2 | V |
| **DYNAMIC** | | | | | | |
| Qg | Total Gate Charge | $V_{DS}$=80V, $V_{GS}$=10V, $I_D$=3A | | 18.3 | | nC |
| Qg | Total Gate Charge | $V_{DS}$=80V, $V_{GS}$=4.5V, $I_D$=3A | | 10.2 | | |
| Qgs | Gate-Source Charge | | | 3.4 | | |
| Qgd | Gate-Drain Charge | | | 5 | | |
| Ciss | Input capacitance | $V_{DS}$=15V, $V_{GS}$=0V, f=1.0MHz | | 543 | | pF |
| Coss | Output Capacitance | | | 69 | | |
| Crss | Reverse Transfer Capacitance | | | 24 | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$=50V, $R_L$ =50$\Omega$ $V_{GEN}$=10V, $R_G$=6$\Omega$ | | 12.2 | | ns |
| tr | Turn-On Rise Time | | | 4.3 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 39.3 | | |
| tf | Turn-Off Fall Time | | | 14.4 | | |

Notes: a. Pulse test: pulse width≦ 300us, duty cycle≦ 2%, Guaranteed by design, not subject to production testing.

b. Matsuki Electric/ Force mos reserves the right to improve product design, functions and reliability without notice.
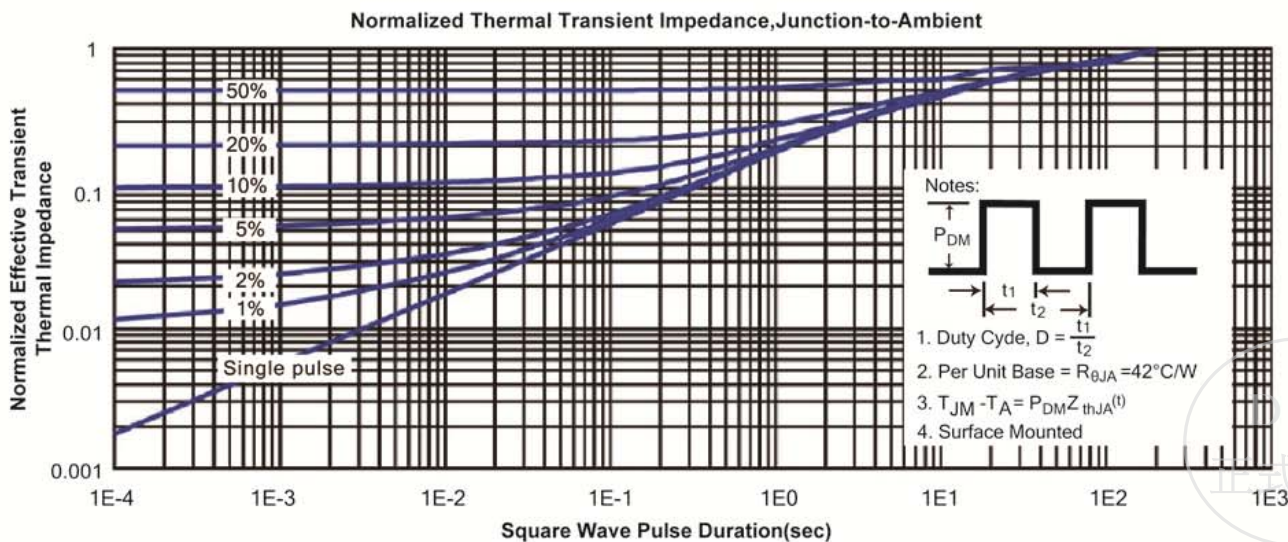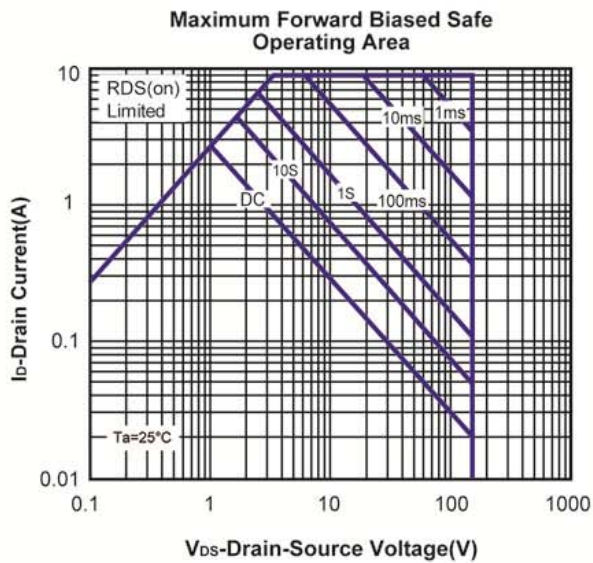
**N-Channel 150V (D-S) MOSFET**

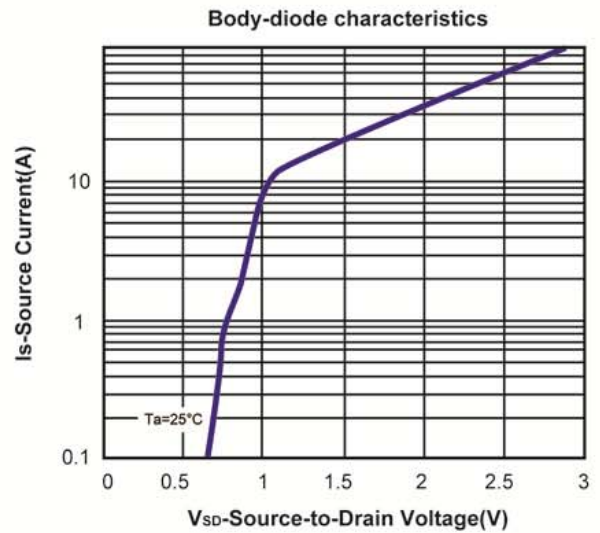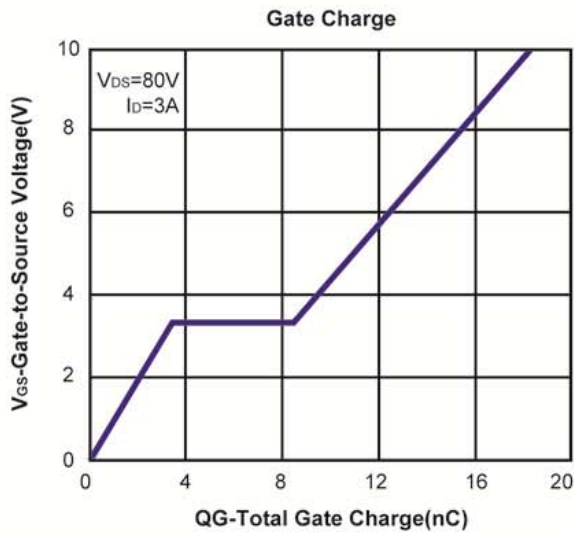**Typical Characteristics (TJ =25℃ Noted)**

### On Resistance vs. Junction Temperature



### On Resistance vs. Drain Current



### Capacitance



### On Resistance vs. Gate-to-Source Voltage



### Threshold Voltage



### On-Region Characteristics

**N-Channel 150V (D-S) MOSFET**

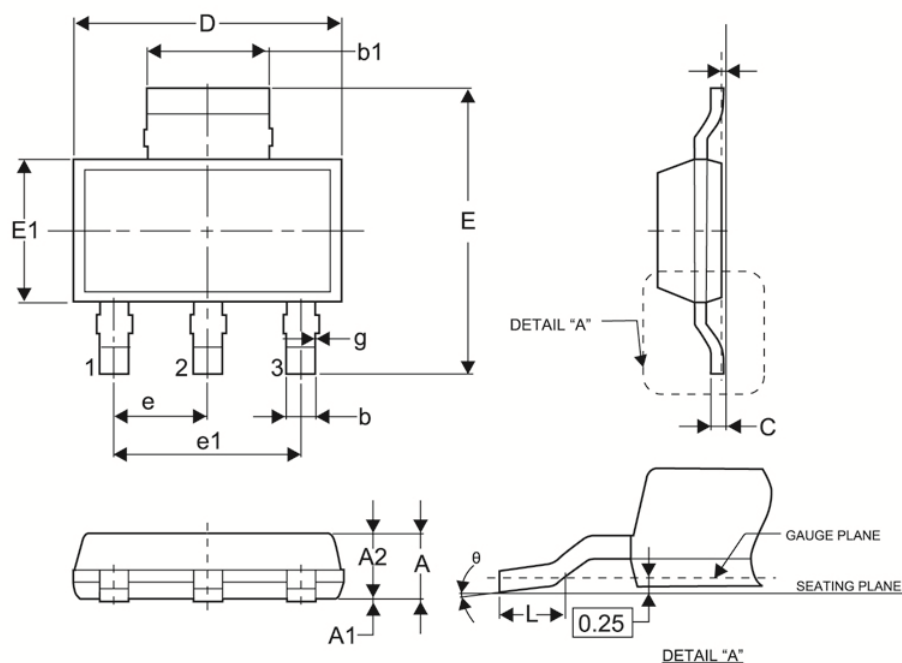**Typical Characteristics (TJ =25℃ Noted)**



Gate Charge



Body-diode characteristics



Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance,Junction-to-Ambient

Notes:

1. Duty Cyde, $D = \frac{t_1}{t_2}$
2. Per Unit Base = $R_{\theta JA}$ =42°C/W
3. $T_{JM} - T_A = P_{DM} Z_{thJA}^{(t)}$
4. Surface Mounted

## SOT-223-3L Package Outline



| Symbol | DIMENSIONS MILLIMETERS | |
| --- | --- | --- |
| | MIN | MAX |
| A | - | 1.80 |
| A1 | 0.02 | 0.10 |
| A2 | 1.50 | 1.70 |
| b | 0.66 | 0.84 |
| b1 | 2.90 | 3.10 |
| g | - | 0.06 |
| C | 0.23 | 0.35 |
| D | 6.30 | 6.70 |
| E | 6.70 | 7.30 |
| E1 | 3.30 | 3.70 |
| e | 2.30 BSC | |
| e1 | 4.60 BSC | |
| L | 0.81 | - |
| θ | 0° | 10° |

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