

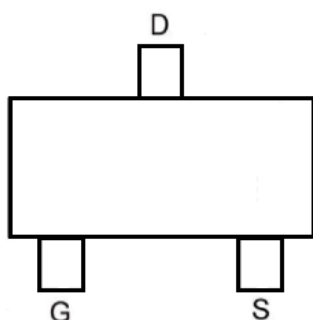
## N-Channel 60V (D-S) MOSFET, ESD Protection

### GENERAL DESCRIPTION

The ME2N70023D2-G 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 , and low in-line power loss are needed in a very small outline surface mount package.

### PIN CONFIGURATION

Small SOT-23  
Top View

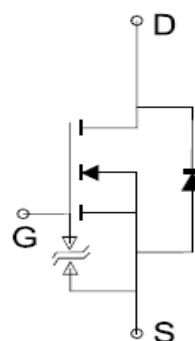


### FEATURES

- $R_{DS(ON)} \leq 3\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leq 4\Omega @ V_{GS}=4.5V$
- $R_{DS(ON)} \leq 4.5\Omega @ V_{GS}=3V$
- ESD Protection HBM  $\geq 2KV$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding

### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch
- DSC



**N-Channel MOSFET**

**Ordering Information:** ME2N7002D2S-G (Green product-Halogen free)

### Absolute Maximum Ratings ( $T_A=25^\circ C$ Unless Otherwise Noted)

| Parameter                               |                  | Symbol          | Maximum Ratings | Unit         |
|-----------------------------------------|------------------|-----------------|-----------------|--------------|
| Drain-Source Voltage                    |                  | $V_{DS}$        | 60              | V            |
| Gate-Source Voltage                     |                  | $V_{GS}$        | $\pm 20$        | V            |
| Continuous Drain                        | $T_A=25^\circ C$ | $I_D$           | 0.27            | A            |
|                                         | $T_A=70^\circ C$ | $I_D$           | 0.22            |              |
| Pulsed Drain Current                    |                  | $I_{DM}$        | 1.1             | A            |
| Maximum Power Dissipation               | $T_A=25^\circ C$ | $P_D$           | 0.4             | W            |
|                                         | $T_A=70^\circ C$ | $P_D$           | 0.2             |              |
| Operating Junction Temperature          |                  | $T_J$           | -55 to 150      | $^\circ C$   |
| Thermal Resistance-Junction to Ambient* |                  | $R_{\theta JA}$ | 350             | $^\circ C/W$ |

\* The device mounted on 1in<sup>2</sup> FR4 board with 2 oz copper

**N-Channel 60V (D-S) MOSFET, ESD Protection**
**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Specified)

| Symbol              | Parameter                       | Limit                                                                    | Min | Typ  | Max      | Unit     |
|---------------------|---------------------------------|--------------------------------------------------------------------------|-----|------|----------|----------|
| <b>STATIC</b>       |                                 |                                                                          |     |      |          |          |
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage  | $V_{GS}=0V, I_D=250\mu A$                                                | 60  |      |          | V        |
| V <sub>GS(th)</sub> | Gate Threshold Voltage          | $V_{DS}=V_{GS}, I_D=250\mu A$                                            | 1   |      | 2.5      | V        |
| I <sub>GSS</sub>    | Gate-Body Leakage               | $V_{DS}=0V, V_{GS}=\pm 20V$                                              |     |      | $\pm 10$ | $\mu A$  |
| I <sub>DSS</sub>    | Zero Gate Voltage Drain Current | $V_{DS}=60V, V_{GS}=0V$                                                  |     |      | 1        | $\mu A$  |
| R <sub>DS(ON)</sub> | Drain-Source On-Resistance*     | $V_{GS}=10V, I_D=500mA$                                                  |     | 1.8  | 3        | $\Omega$ |
|                     |                                 | $V_{GS}=4.5V, I_D=200mA$                                                 |     | 2.3  | 4        |          |
|                     |                                 | $V_{GS}=3V, I_D=10mA$                                                    |     | 3.8  | 4.5      |          |
| V <sub>SD</sub>     | Diode Forward Voltage *         | $I_S=200mA, V_{GS}=0V$                                                   |     | 0.82 | 1.3      | V        |
| <b>DYNAMIC</b>      |                                 |                                                                          |     |      |          |          |
| Q <sub>g</sub>      | Total Gate Charge               | $V_{DS}=30V, V_{GS}=10V, I_D=200mA$                                      |     | 3.7  |          | nC       |
| Q <sub>g</sub>      | Total Gate Charge               | $V_{DS}=30V, V_{GS}=4.5V, I_D=200mA$                                     |     | 1.4  |          |          |
| Q <sub>gs</sub>     | Gate-Source Charge              |                                                                          |     | 2    |          |          |
| Q <sub>gd</sub>     | Gate-Drain Charge               |                                                                          |     | 0.2  |          |          |
| C <sub>iss</sub>    | Input Capacitance               | $V_{DS}=25V, V_{GS}=0V, f=1MHz$                                          |     | 15   |          | pF       |
| C <sub>oss</sub>    | Output Capacitance              |                                                                          |     | 2    |          |          |
| C <sub>rss</sub>    | Reverse Transfer Capacitance    |                                                                          |     | 1    |          |          |
| t <sub>d(on)</sub>  | Turn-On Delay Time              | $V_{DS}=30V, R_L=150\Omega$<br>$V_{GS}=10V, R_G=10\Omega$<br>$I_D=200mA$ |     | 3.7  |          | ns       |
| t <sub>r</sub>      | Turn-On Rise Time               |                                                                          |     | 21.7 |          |          |
| t <sub>d(off)</sub> | Turn-Off Delay Time             |                                                                          |     | 5.9  |          |          |
| t <sub>f</sub>      | Turn-Off Fall Time              |                                                                          |     | 21.4 |          |          |

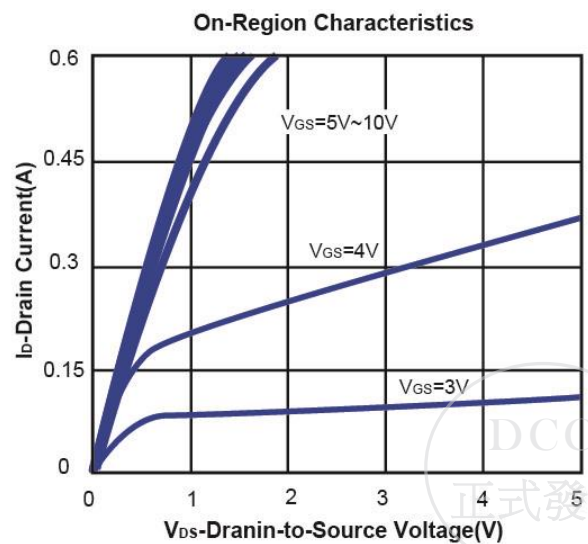
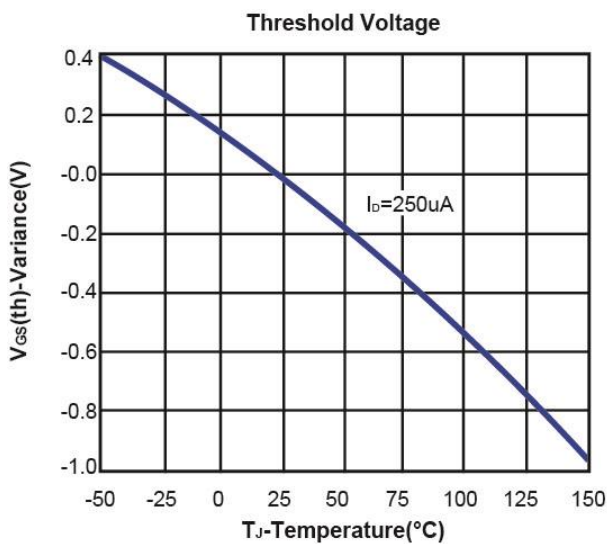
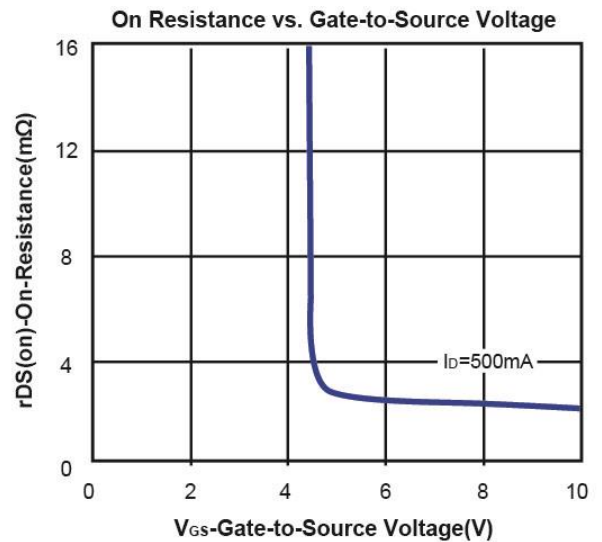
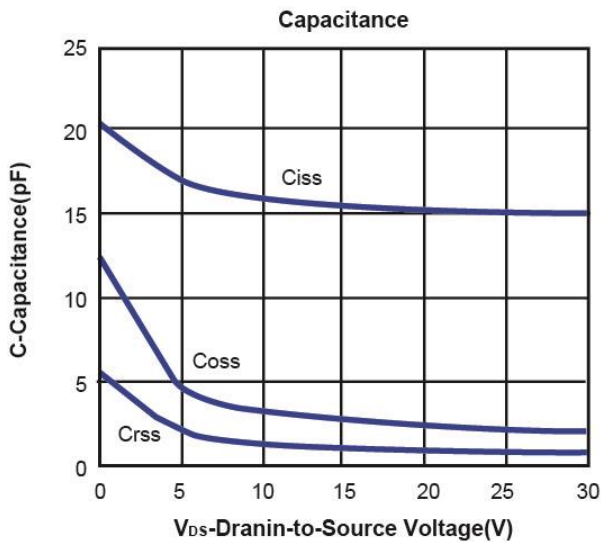
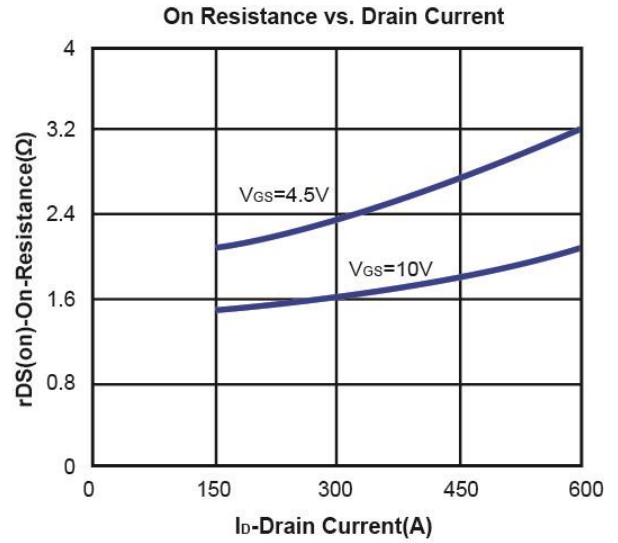
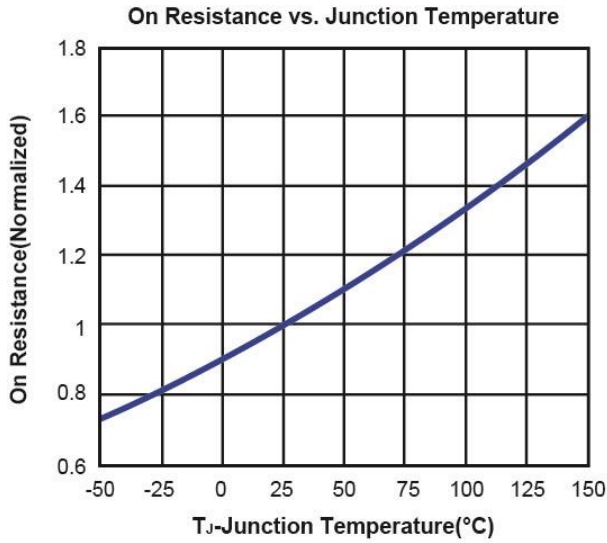
Notes: a, pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ , Guaranteed by design, not subject to production testing.

b. Matsuki Electric/ Force mos reserves the right to improve product design, functions and reliability without notice.



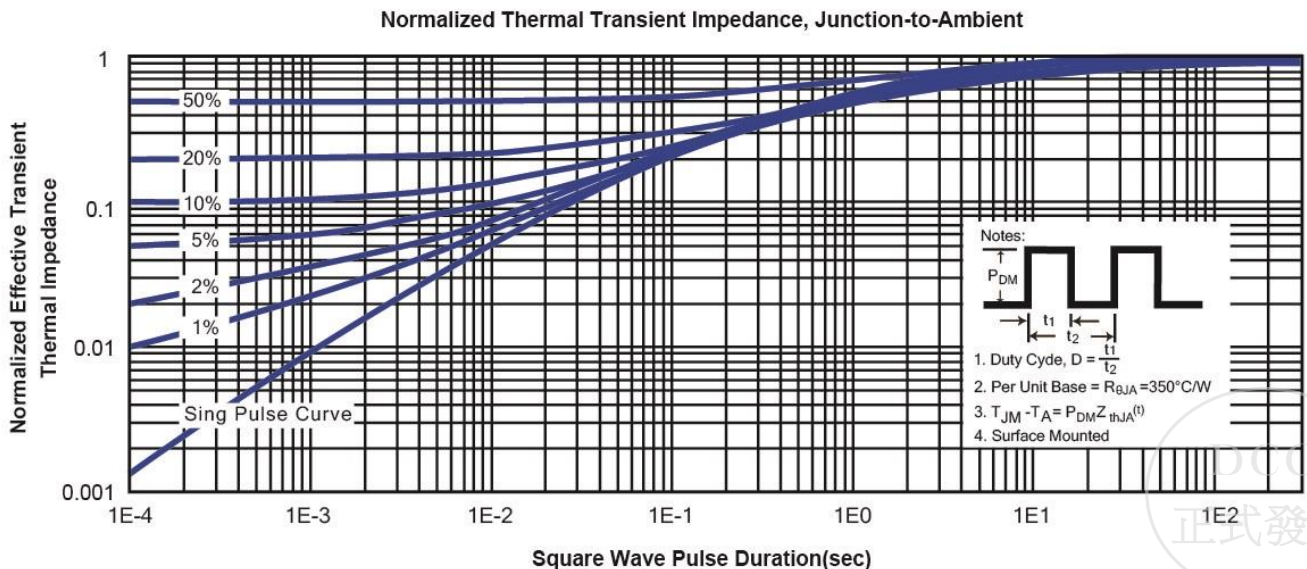
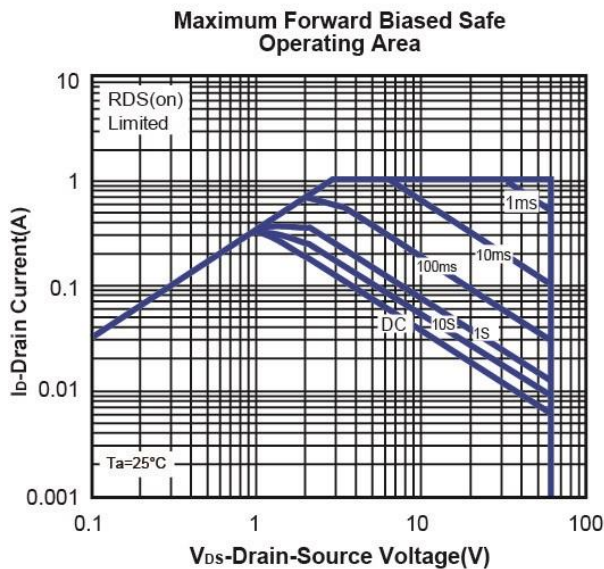
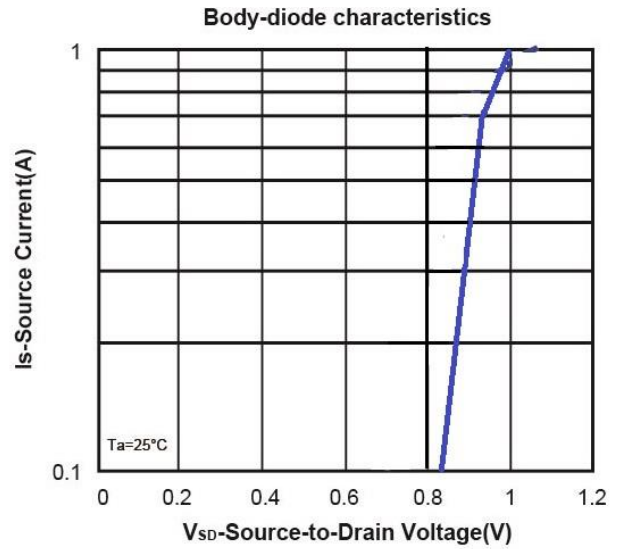
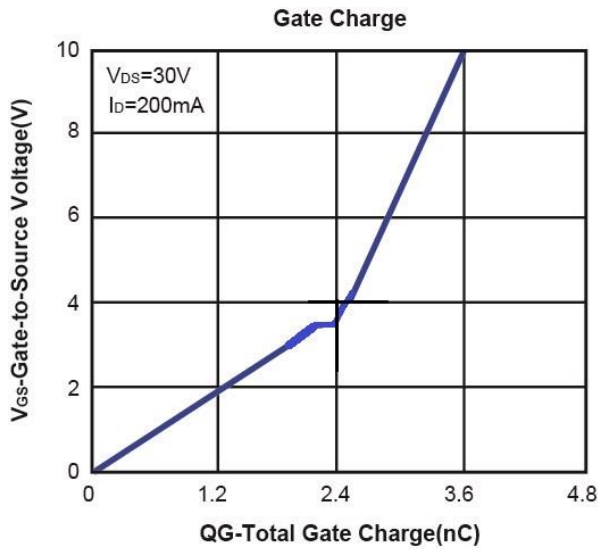
**N-Channel 60V (D-S) MOSFET, ESD Protection**

**Typical Characteristics (T<sub>J</sub> =25°C Noted)**



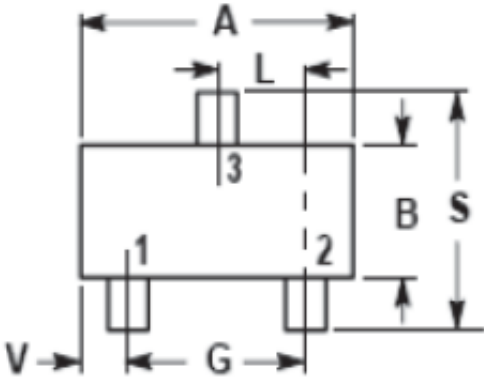
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**Typical Characteristics (T<sub>J</sub> =25°C Noted)**



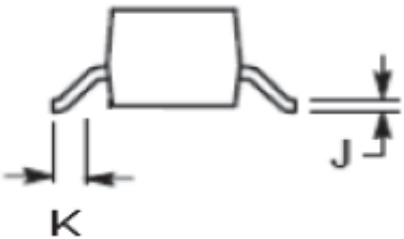
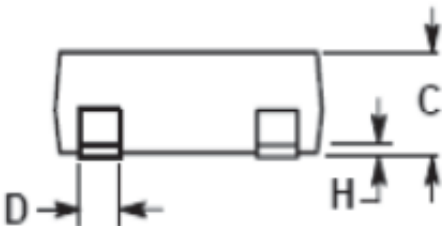
N-Channel 60V (D-S) MOSFET, ESD Protection

Small SOT-23 Package



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES |        | MILLIMETERS |       |
|-----|--------|--------|-------------|-------|
|     | MIN    | MAX    | MIN         | MAX   |
| A   | 0.1102 | 0.1197 | 2.80        | 3.04  |
| B   | 0.0472 | 0.0551 | 1.20        | 1.40  |
| C   | 0.0350 | 0.0440 | 0.89        | 1.11  |
| D   | 0.0150 | 0.0200 | 0.37        | 0.5   |
| G   | 0.0701 | 0.0807 | 1.78        | 2.04  |
| H   | 0.0005 | 0.0040 | 0.013       | 0.100 |
| J   | 0.0034 | 0.0070 | 0.085       | 0.177 |
| K   | 0.007  | —      | 0.018       | —     |
| L   | 0.0350 | 0.0401 | 0.89        | 1.02  |
| S   | 0.0830 | 0.1039 | 2.10        | 2.64  |
| V   | 0.0177 | 0.0236 | 0.45        | 0.60  |



DCC  
正式發行

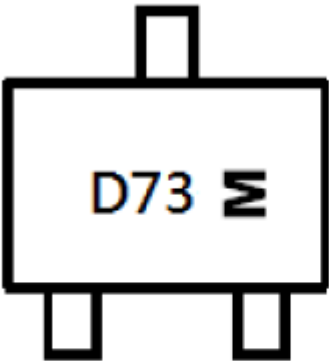


N-Channel 60V (D-S) MOSFET, ESD Protection

Device name: ME2N70023D2-G

Package: SOT-23

Marking Code



D73:Device Marking Code  
M:Date code

MONTH CODE

ODD YEARS(2007,2009)

|     |   |
|-----|---|
| Jan | 1 |
| Feb | 2 |
| Mar | 3 |
| Apr | 4 |
| May | 5 |
| Jun | 6 |
| Jul | 7 |
| Aug | 8 |
| Sep | 9 |
| Oct | T |
| Nov | V |
| Dec | C |

EVEN YEARS(2006,2008)

|     |   |
|-----|---|
| Jan | E |
| Feb | F |
| Mar | H |
| Apr | J |
| May | K |
| Jun | L |
| Jul | N |
| Aug | P |
| Sep | U |
| Oct | X |
| Nov | Y |
| Dec | Z |

DCC  
正式發行