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

### GENERAL DESCRIPTION

The ME7692 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.

### FEATURES

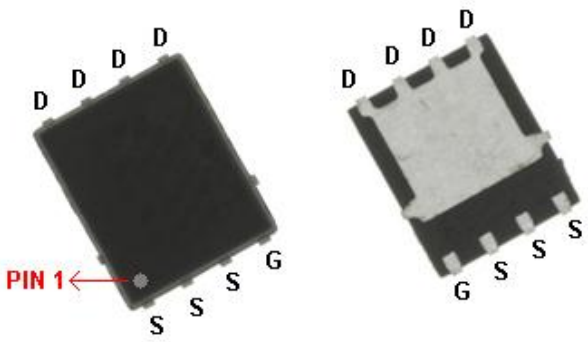
- $R_{DS(ON)} \leqq 6m\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 8.1m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

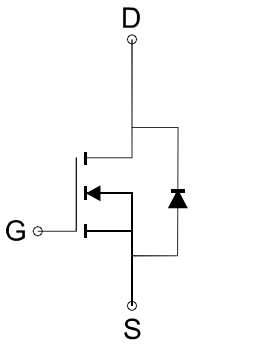
### APPLICATIONS

- Power Management
- DC/DC Converter

### PIN CONFIGURATION

**PowerDFN 5x6**




N-Channel MOSFET

**Ordering Information**: ME7692 (Pb-free)

ME7692-G (Green product-Halogen free)

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

| Parameter | | Symbol | Maximum Ratings | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 60 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current* | $T_A$=25℃ | $I_D$ | 17 | A |
| | $T_A$=70℃ | | 13.6 | |
| Pulsed Drain Current | | $I_{DM}$ | 68 | A |
| Maximum Power Dissipation | $T_A$=25℃ | $P_D$ | 2.8 | W |
| | $T_A$=70℃ | | 1.8 | |
| Operating Junction and Storage Temperature Range | | TJ, Tstg | -55 to 175 | ℃ |
| Thermal Resistance-Junction to Ambient* | | $R_{\theta JA}$ | 45 | ℃/W |

Note 1 : Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 80A.

Note 2 : The device mounted on 1in$^2$ FR4 board with 2 oz copper.

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

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

| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | 60 | | | V |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1 | | 3 | V |
| $I_{GSS}$ | Gate-Body Leakage | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=60V, $V_{GS}$=0V | | | 1 | μA |
| $R_{DS(ON)}$ | Drain-Source On-Resistance* | $V_{GS}$=10V, $I_D$=25A | | 5.0 | 6 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=25A | | 6.1 | 8.1 | |
| $V_{SD}$ | Diode Forward Voltage* | $I_S$=20A, $V_{GS}$=0V | | 0.8 | 1.3 | V |
| **DYNAMIC** | | | | | | |
| Qg | Total Gate Charge | $V_{DS}$=30V, $V_{GS}$=10V, $I_D$=30A | | 169 | | nc |
| Qg | Total Gate Charge | $V_{DS}$=30V, $V_{GS}$=4.5V, $I_D$=30A | | 78.5 | | |
| Qgs | Gate-Source Charge | | | 35 | | |
| Qgd | Gate-Drain Charge | | | 38.5 | | |
| Ciss | Input Capacitance | $V_{DS}$=30V, $V_{GS}$=0V, f=1MHz | | 8861 | | pF |
| Coss | Output Capacitance | | | 325 | | |
| Crss | Reverse Transfer Capacitance | | | 285 | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=30V, $I_D$=1A, $V_{GS}$ =10V, $R_G$=6Ω, $R_L$=30Ω | | 46.1 | | ns |
| $t_r$ | Turn-On Rise Time | | | 33.6 | | |
| $t_{d(off)}$ | Turn-Off Delay Time | | | 204 | | |
| $t_f$ | Turn-Off Fall Time | | | 55.7 | | |

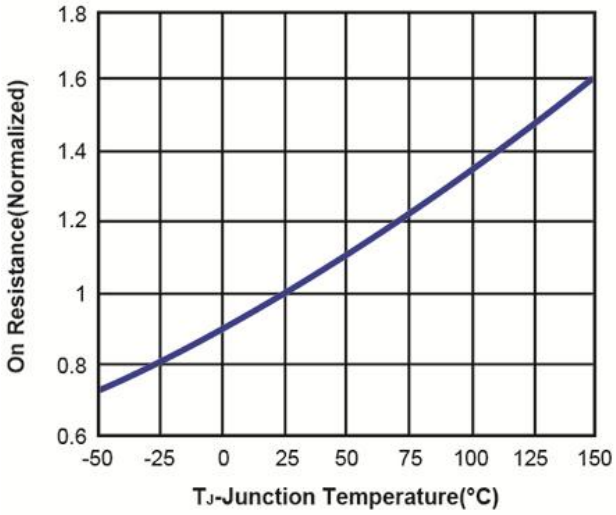
Notes: a, pulse test: pulse width≦ 300us, duty cycle≦ 2%, Guaranteed by design, not subject to production testing.

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

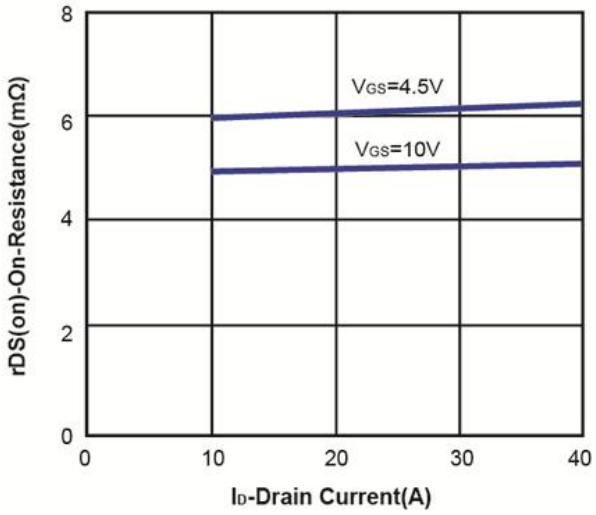
## N-Channel 60V (D-S) MOSFET

### Typical Characteristics ($T_J$ =25℃ Noted)

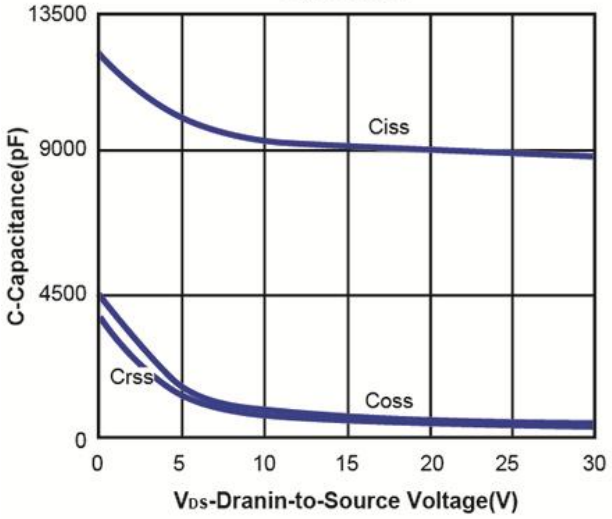
On Resistance vs. Junction Temperature



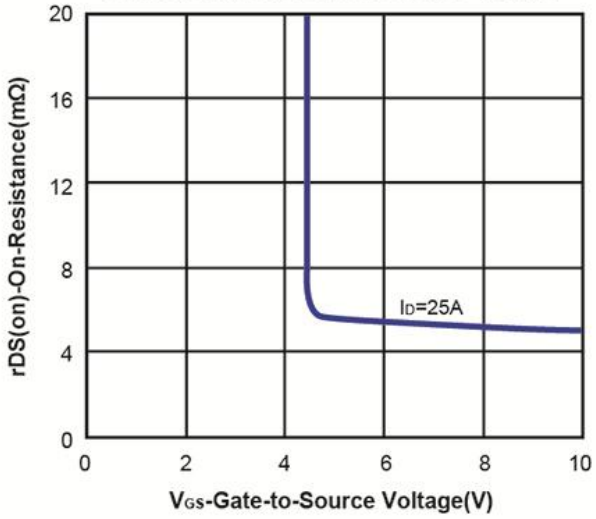

On Resistance vs. Drain Current



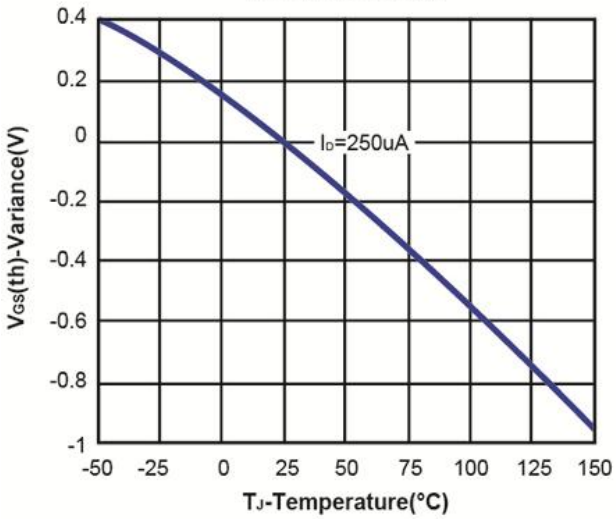

Capacitance



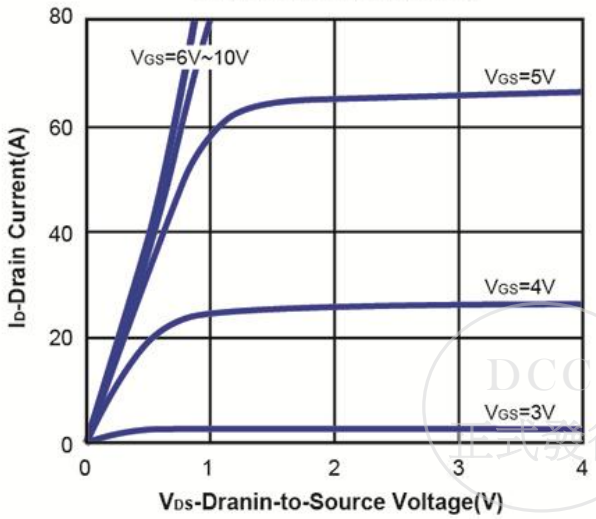

On Resistance vs. Gate-to-Source Voltage




Threshold Voltage



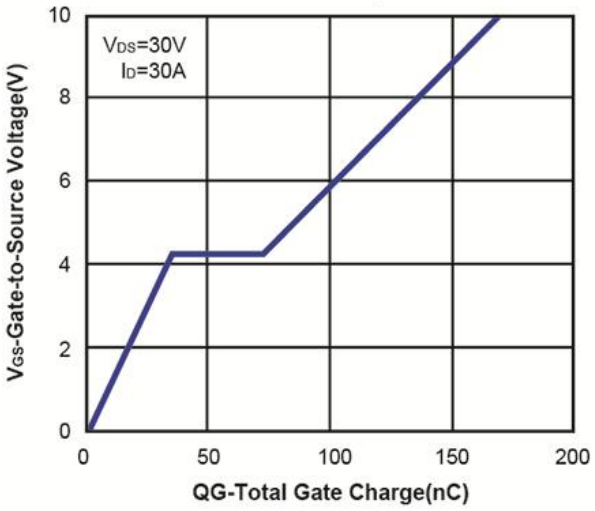

On-Region Characteristics



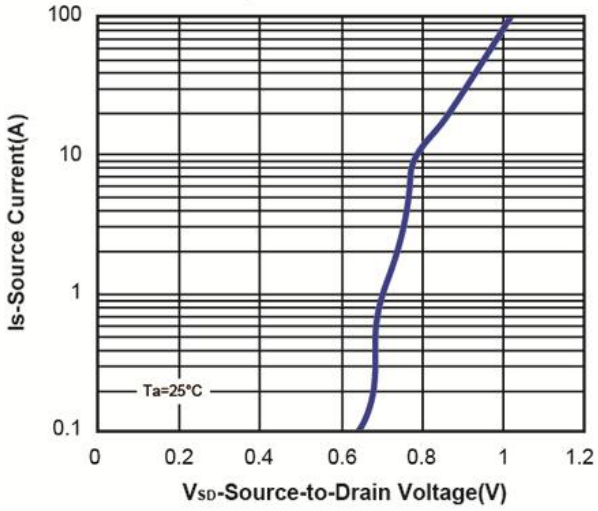
## N-Channel 60V (D-S) MOSFET

### Typical Characteristics ($T_J$ =25℃ Noted)

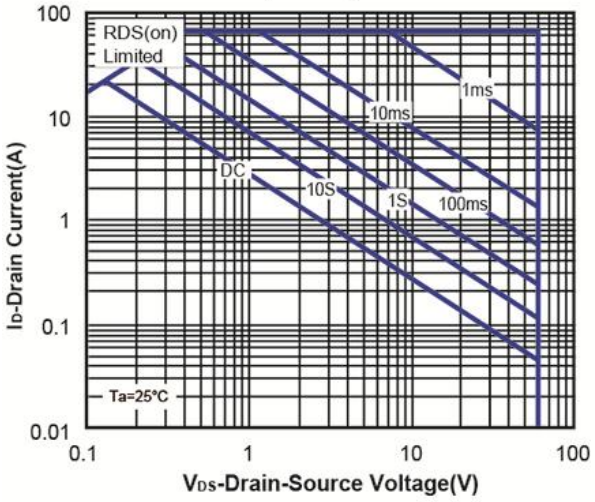
Gate Charge



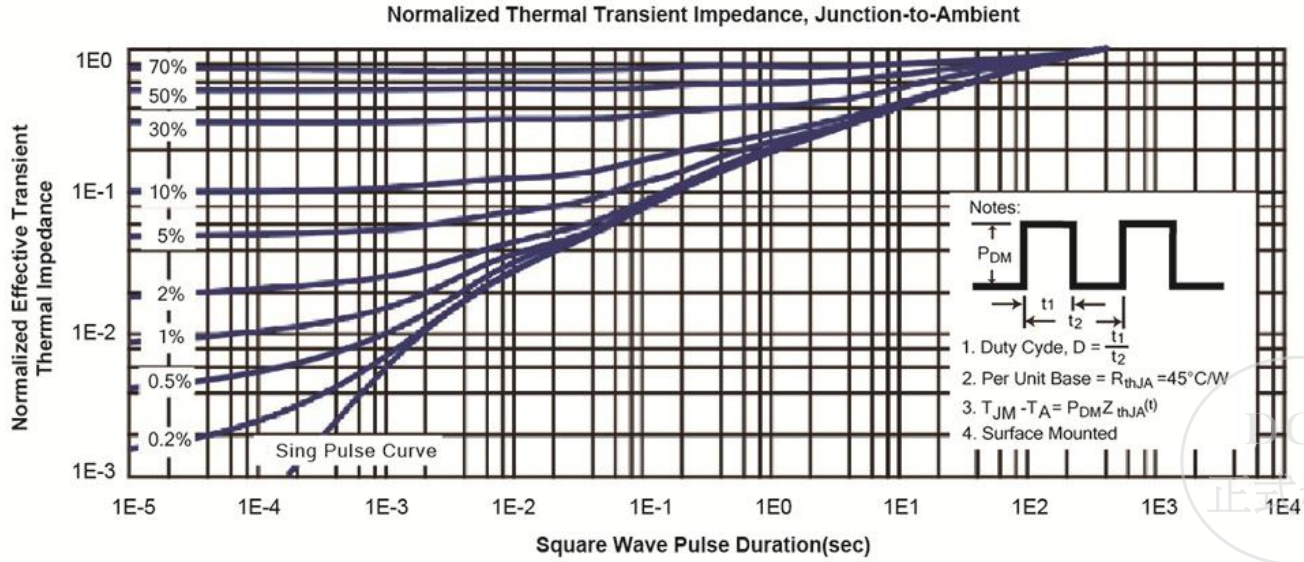

Body-diode characteristics



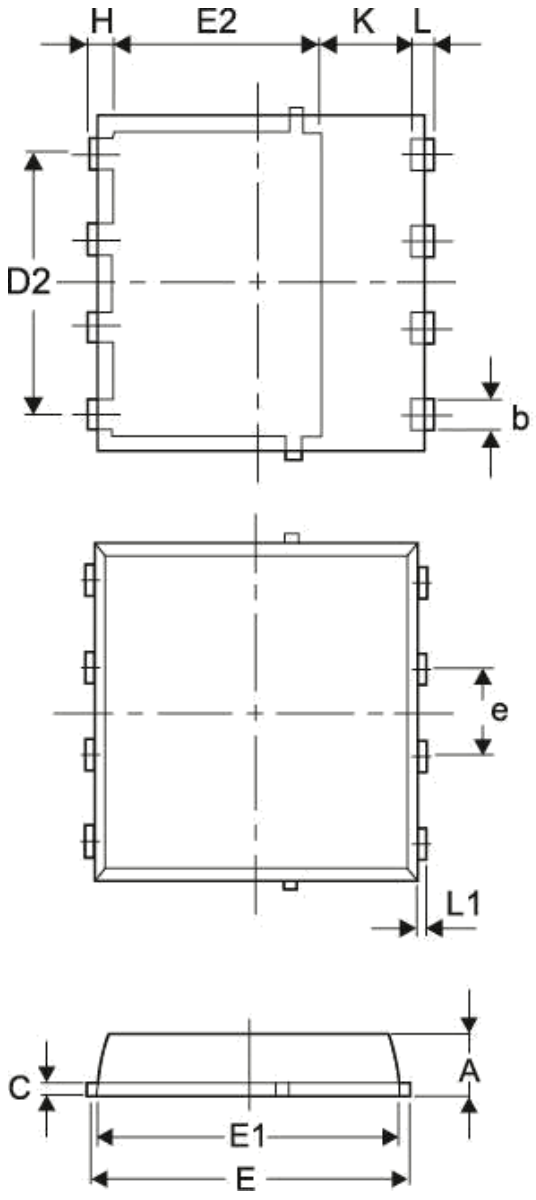

Maximum Forward Biased Safe Operating Area

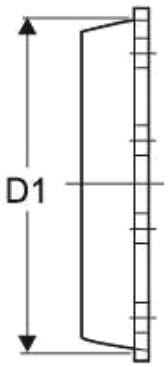



Normalized Thermal Transient Impedance, Junction-to-Ambient



## DFN5X6 Package Outline




| Symbol | MILLIMETERS (mm) | |
|---|---|---|
| | MIN | MAX |
| A | 0.90 | 1.25 |
| b | 0.33 | 0.51 |
| C | 0.155 | 0.30 |
| D1 | 4.80 | 5.00 |
| D2 | 3.61 | 3.96 |
| E | 5.8 | 6.20 |
| E1 | 5.6 | 5.90 |
| E2 | 3.35 | 4.31 |
| e | 1.27 BSC | |
| H | 0.35 | 0.61 |
| K | 1.60 | - |
| L | 0.35 | 0.71 |
| L1 | 0.05 | 0.20 |