## DESCRIPTION

The MX15P03 uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

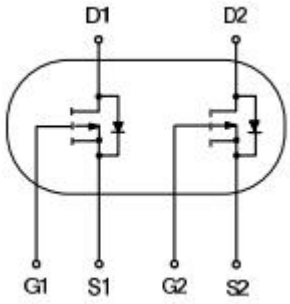
## GENERAL FEATURES

- $V_{DS}$=-30V, $I_D$=-10A
  $R_{DS(ON)}$(Typ.)=24mΩ @ $V_{GS}$=-4.5V
  $R_{DS(ON)}$(Typ.)=14.5mΩ @ $V_{GS}$=-10V
- Low Thermal Resistance
- Advanced trench cell design

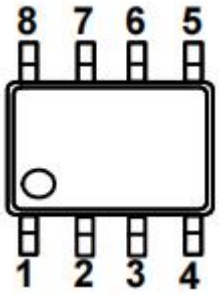
## APPLICATION

- Motor drivers
- DC-DC Converter

## PINOUT




Schematic diagram




SOP-8L top view

| Pin | Description |
|---|---|
| 1 | Source(S1) |
| 2 | Gate(G1) |
| 3 | Source(S2) |
| 4 | Gate(G2) |
| 5,6 | Drain(D2) |
| 7,8 | Drain(D1) |

## ORDERING INFORMATION

| Part Number | StorageTemperature | Package | Devices Per Reel |
|---|---|---|---|
| MX15P03 | -55°C to 150°C | SOP8 | 3000 |

## ABSOLUTE MAXIMUM RATINGS($T_C$=25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Drain Current($V_{GS}$=-10V)(Note1) | $I_D$ | -10 | A |
| Pulsed Source Current($V_{GS}$=-10V)(Note1)(Note2)(Note3) | $I_{DM}$ | -60 | A |
| Diode Forward Current | $I_S$ | -10 | A |
| Total Power Dissipation(Note1) | $P_{tot}$ | 20 | W |
| Operating Junction and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to 150 | °C |
| Thermal Resistance, Junction-to-Case(Note1) | $R_{\theta JC}$ | 6 | °C/W |

Note 1. Surface Mounted on 1 $in^2$ pad area, t ≤ 10 sec
Note 2. Pulse width ≤ 10μs, duty cycle ≤ 1%
Note 3. limited by bonding wire

## ELECTRICAL CHARACTERISTICS($T_C$=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=-250μA | -30 | - | - | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-24V, $V_{GS}$=0V | - | - | -1 | μA |
| | | $V_{DS}$=-24V,$V_{GS}$=0V,$T_J$=85°C | - | - | -30 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1.0 | - | -2.0 | V |
| Drain-Source On-State Resistance(Note1) | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-5A | - | 24 | 28 | mΩ |
| | | $V_{GS}$=-10V, $I_D$=-8A | - | 14.5 | 18 | mΩ |
| **Dynamic Characteristics(Note2)** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-15V, $V_{GS}$=0V, F=1.0MHz | - | 1811 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 172 | - | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 134 | - | pF |
| **Switching Characteristics(Note2)** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DS}$=-15V, $I_D$=-8A, $V_{GEN}$=-10V, $R_G$=4.5Ω, $R_L$=0.75Ω, | - | 18 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 86 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 231 | - | nS |
| Turn-Off Fall Time | $t_f$ | | - | 127 | - | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-15V, $I_{DS}$=-8A, $V_{GS}$=-10V | - | 31 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 8.6 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 4.8 | - | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Voltage(Note1) | $V_{SD}$ | $V_{GS}$=0V, $I_{SD}$=-8A | - | - | -1.3 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{SD}$=-8A, $dI_{SD}/dt$=100A/μs | - | 8.3 | - | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 0.6 | - | nC |

Note 1. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
Note 2. Guaranteed by design, not subject to prduction testing

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

**Figure 1. Power Capability**

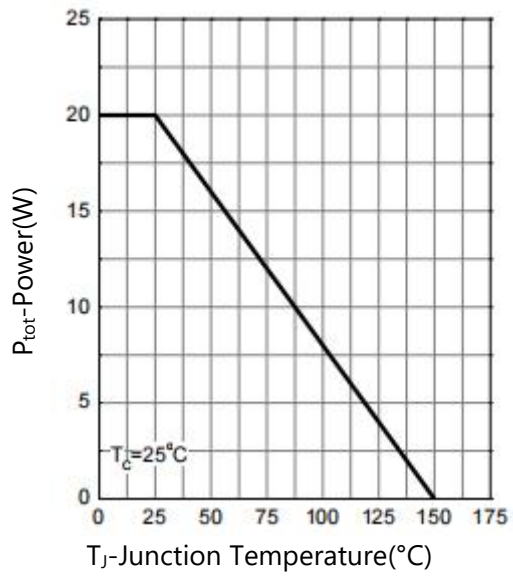



**Figure 2. Current Capability**

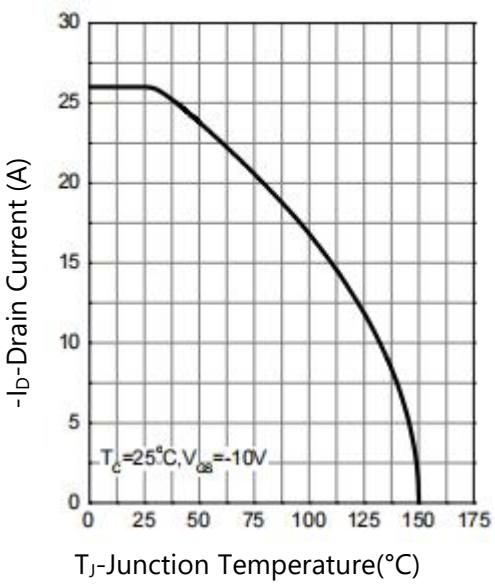



**Figure 3. Safe Operation Area**

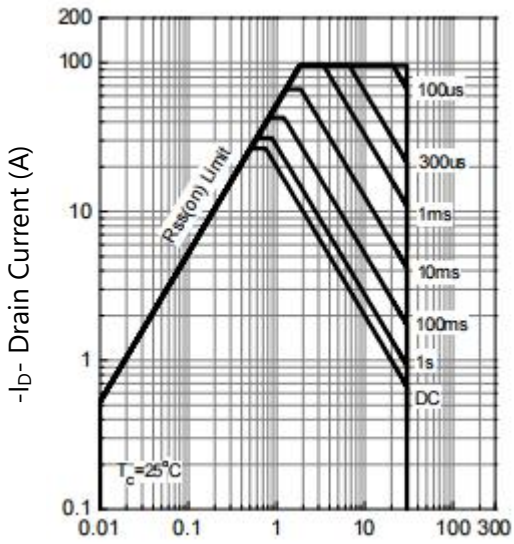
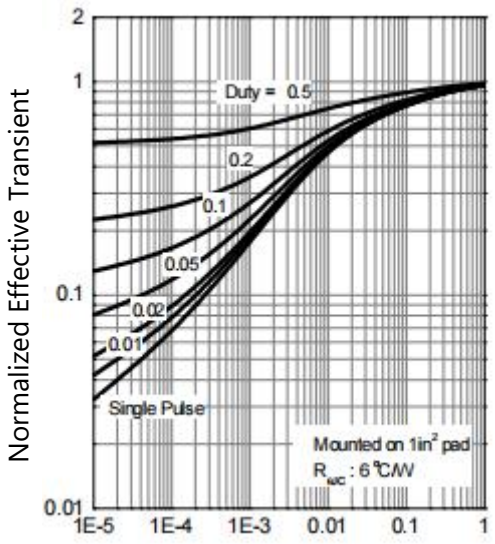



**Figure 4. Transient Thermal Impedance**



## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

**Figure 5. Output Characteristics**

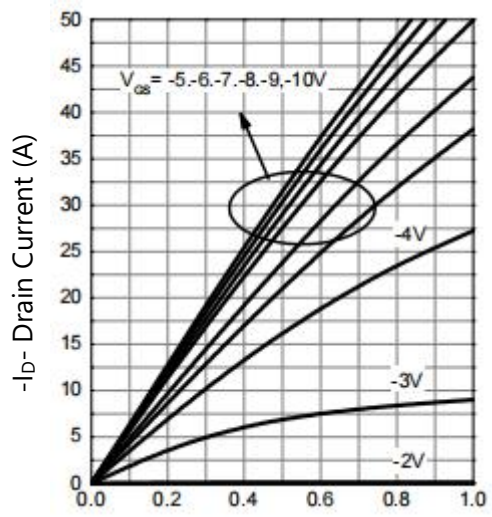



**Figure 6. Drain-Source On Resistance**

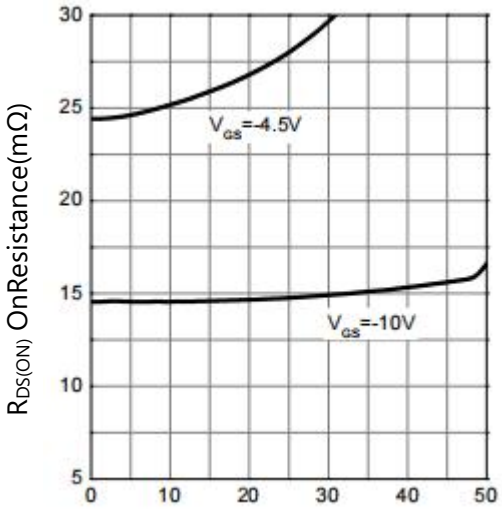



**Figure 7. Transfer Characteristics**

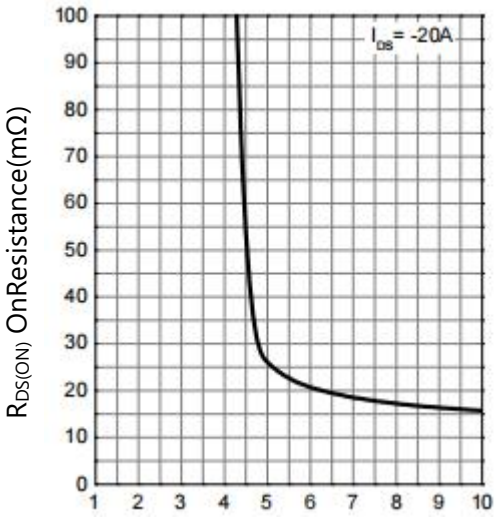
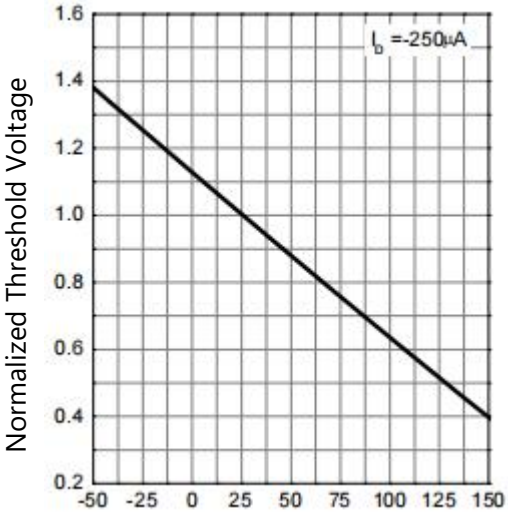



**Figure 8. Normalized Threshold Voltage**



## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

**Figure 9. Normalized On Resistance**

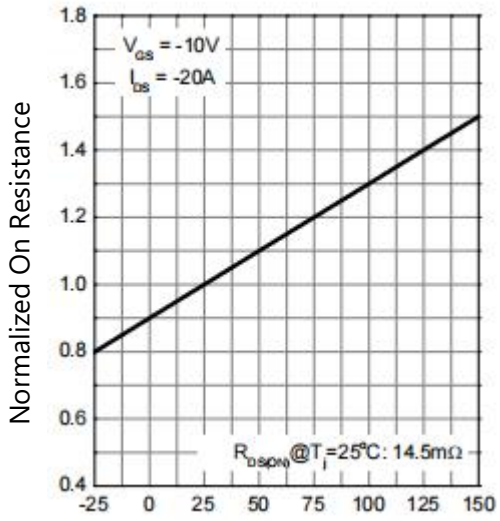



**Figure 10. Diode Forward Current**

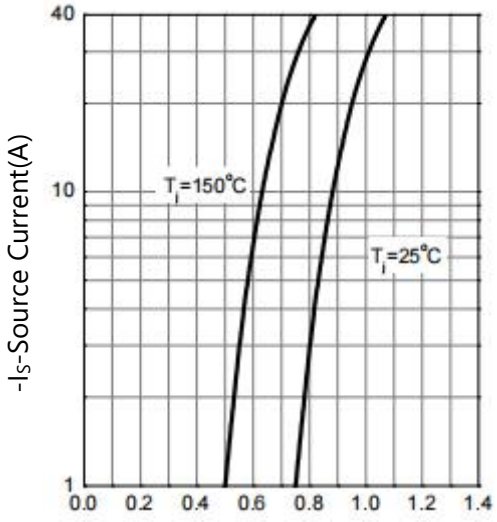



**Figure 11. Capacitance**

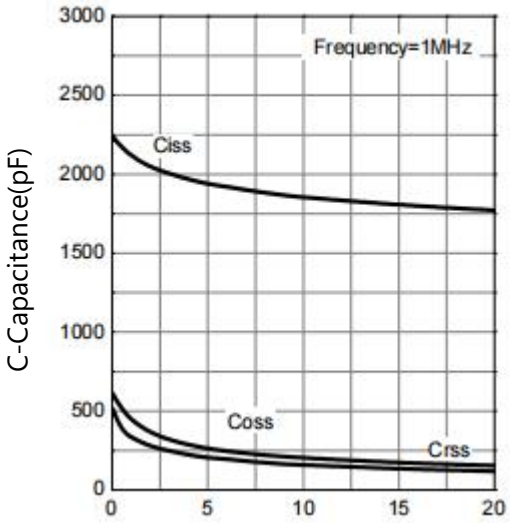
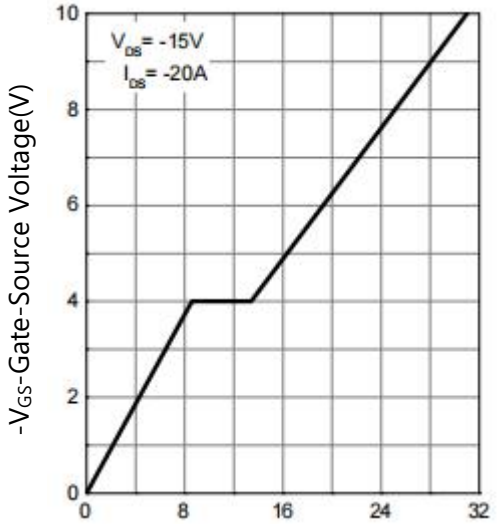
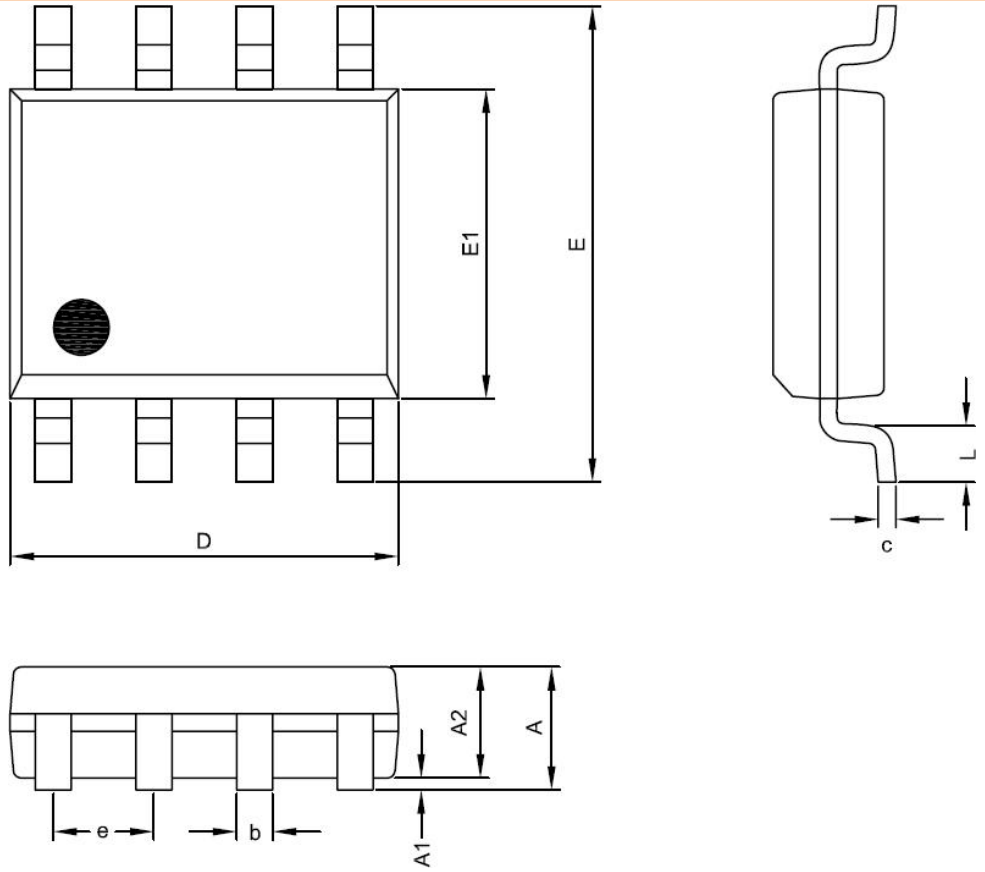



**Figure 12. Gate Charge**



## PACKAGE INFORMATION

**SOP-8L**




| Symbol | Dimensions In Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 1.35 | 1.75 |
| A1 | 0.00 | 0.25 |
| A2 | 1.15 | 1.50 |
| D | 4.80 | 5.00 |
| E | 5.80 | 6.20 |
| E1 | 3.80 | 4.00 |
| c | 0.19 | 0.27 |
| b | 0.33 | 0.53 |
| e | 1.27 BSC | |
| L | 0.40 | 1.27 |

Notes:
1.Jedec outline： MS-012AA
2.Dimensions " D " does not include mold flash, protrusions and gate burrs shall not exceed .15 mm (.006 in) per side .
3.Dimensions " E1 " does not include inter-lead flash, or protrusions. Inter-lead flash and protrusions shall not exceed .25 mm (.010 in) per side.