

TOSHIBA POWER MOS FET MODULE SILICON N CHANNEL MOS TYPE (L²-π-MOSIV 4 IN 1)

MP4403

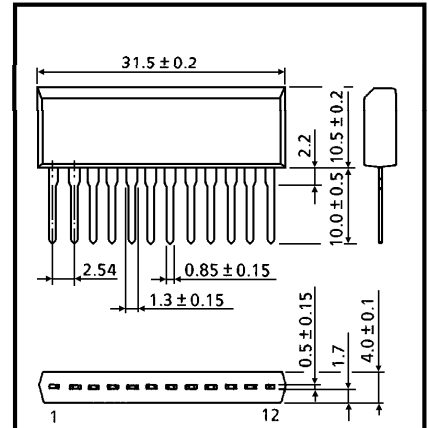
HIGH POWER, HIGH SPEED SWITCHING APPLICATIONS.

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING.

INDUSTRIAL APPLICATIONS

Unit in mm

- 4-Volt Gate Drive Available
- Small Package by Full Molding (SIP 12 Pin)
- High Drain Power Dissipation (4 Devices Operation)
: P_T = 28W (T_c = 25°C)
- Low Drain-Source ON Resistance : R_{DS(ON)} = 0.20Ω (Typ.)
- Low Leakage Current : I_{GSS} = ±10μA (Max.) (V_{GS} = ±16V)
I_{DSS} = 100μA (Max.) (V_{DS} = 120V)
- Enhancement-Mode : V_{th} = 0.8~2.0V (I_D = 1mA)



| | |
|-------------------|-------------------|
| MOS FET | DIODE |
| 1, 5, 8, 12 GATE | 2, 4, 9, 11 ANODE |
| 2, 4, 9, 11 DRAIN | 3, 10 CATHODE |
| 6, 7 SOURCE | |

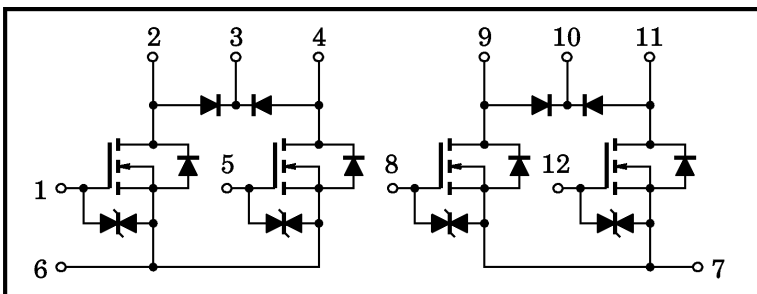
| | |
|---------|---------|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-32C1D |

Weight : 3.9g

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|-----------------------|---------|------|
| Drain-Source Voltage | V _{DSS} | 120 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Drain Current | I _D | 5 | A |
| Peak Drain Current | I _{DP} | 10 | A |
| Drain Power Dissipation (1 Device Operation) | P _D | 2.2 | W |
| Drain Power Dissipation (4 Devices Operation) | T _a = 25°C | 4.4 | W |
| | T _c = 25°C | 28 | |
| Channel Temperature | T _{ch} | 150 | °C |
| Storage Temperature Range | T _{stg} | -55~150 | °C |

ARRAY CONFIGURATION



THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|-----------------------|------|--------|
| Thermal Resistance of Channel to Ambient (4 Devices Operation, Ta=25°C) | $\Sigma R_{th(ch-a)}$ | 28.4 | °C / W |
| Thermal Resistance of Channel to Case (4 Devices Operation, Tc=25°C) | $\Sigma R_{th(ch-c)}$ | 4.46 | °C / W |
| Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s) | T _L | 260 | °C |

This Transistor is an Electrostatic Sensitive Device. Please Handle with Caution.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

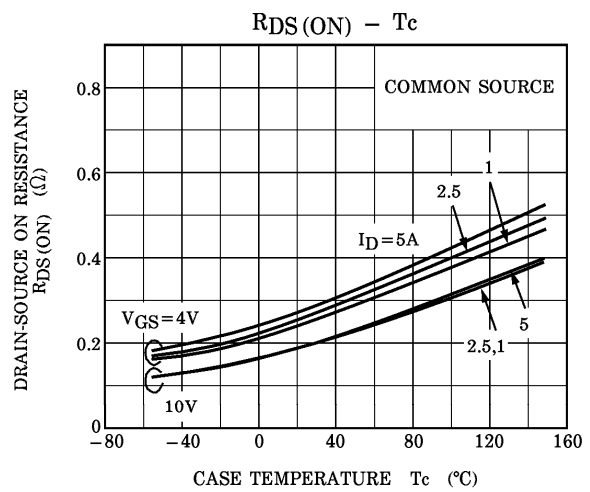
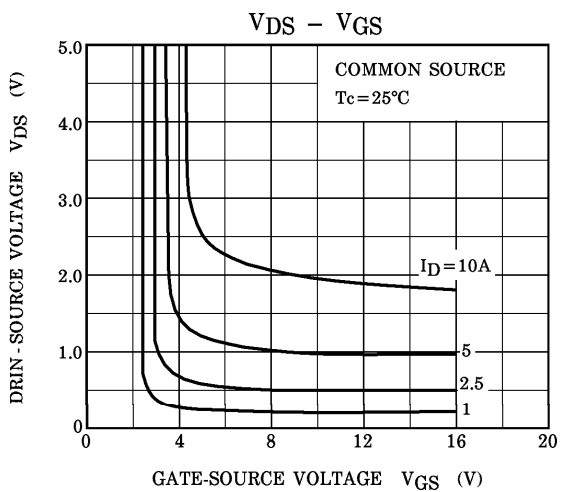
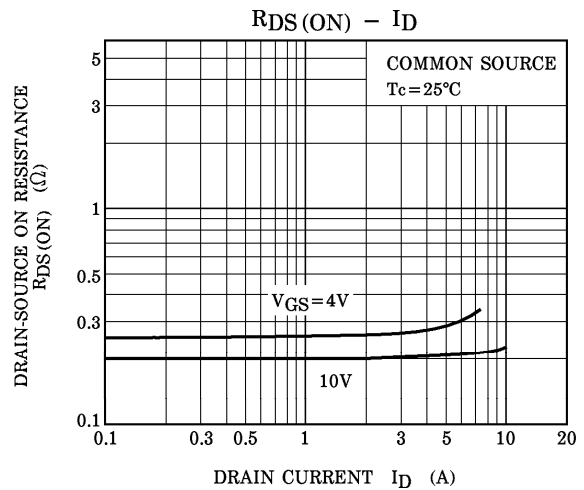
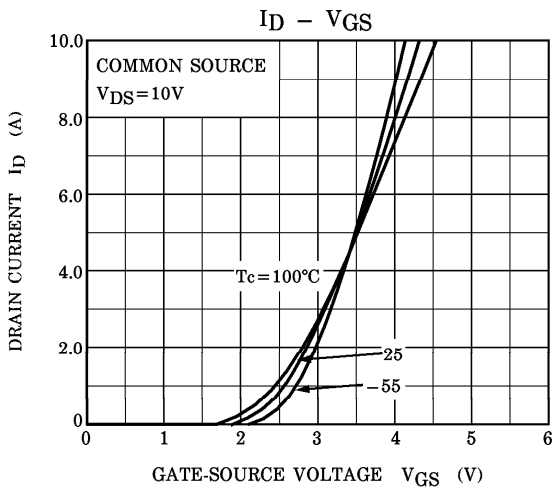
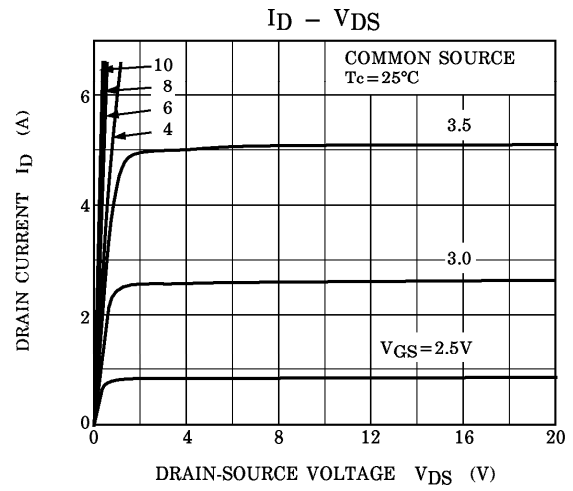
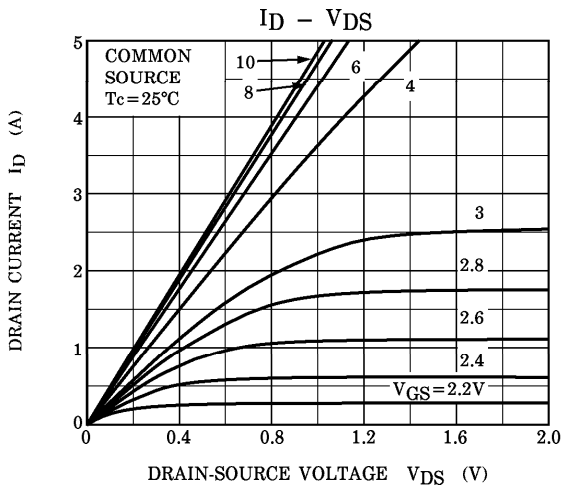
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|--|----------------------|---|------|------|------|------|----|
| Gate Leakage Current | I _{GSS} | V _{GS} = ±16V, V _{DS} = 0 | — | — | ±10 | μA | |
| Drain Cut-off Current | I _{DSS} | V _{DS} = 120V, V _{GS} = 0 | — | — | 100 | μA | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | I _D = 10mA, V _{GS} = 0 | 120 | — | — | V | |
| Gate Threshold Voltage | V _{th} | V _{DS} = 10V, I _D = 1mA | 0.8 | — | 2.0 | V | |
| Forward Transfer Admittance | Y _{fs} | V _{DS} = 10V, I _D = 2.5A | 2.0 | 4.0 | — | S | |
| Drain-Source ON Resistance | R _{DSON} | D = 2.5A, V _{GS} = 4V | — | 0.28 | 0.44 | Ω | |
| | R _{DSON} | I _D = 2.5A, V _{GS} = 10V | — | 0.20 | 0.3 | | |
| Input Capacitance | C _{iss} | V _{DS} = 10V, V _{GS} = 0, f = 1MHz | — | 540 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | V _{DS} = 10V, V _{GS} = 0, f = 1MHz | — | 47 | — | pF | |
| Output Capacitance | C _{oss} | V _{DS} = 10V, V _{GS} = 0, f = 1MHz | — | 180 | — | pF | |
| Switching Time | Rise Time | t _r | | — | 15 | — | ns |
| | Turn-on Time | t _{on} | | — | 50 | — | |
| | Fall Time | t _f | | — | 40 | — | |
| | Turn-off Time | t _{off} | | — | 280 | — | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | Q _g | I _D = 5A, V _{GS} = 10V, V _{DD} = 96V | — | 27 | — | nC | |
| Gate-Source Charge | Q _{gs} | | — | 18 | — | | |
| Gate-Drain ("Miller") Charge | Q _{gd} | | — | 9 | — | | |

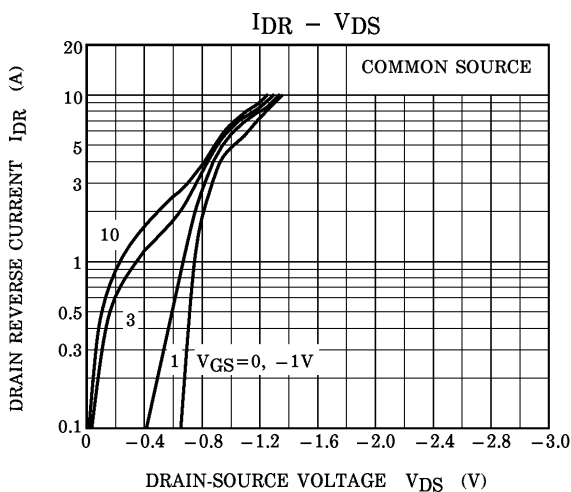
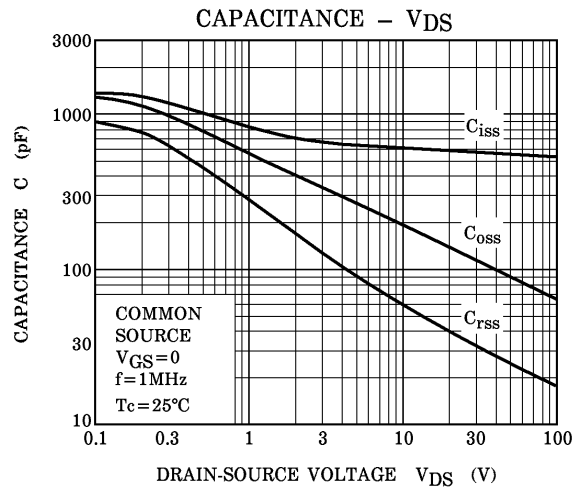
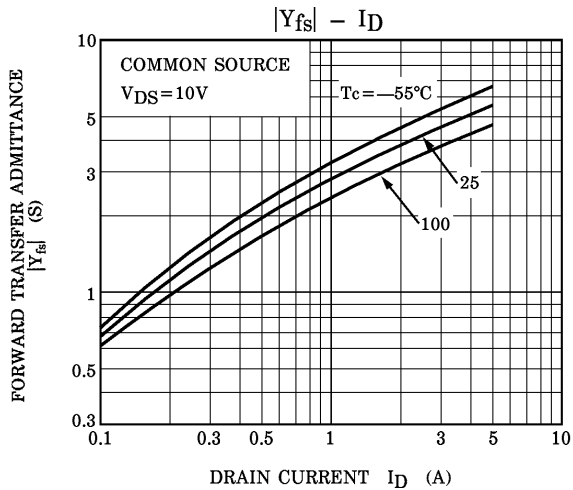
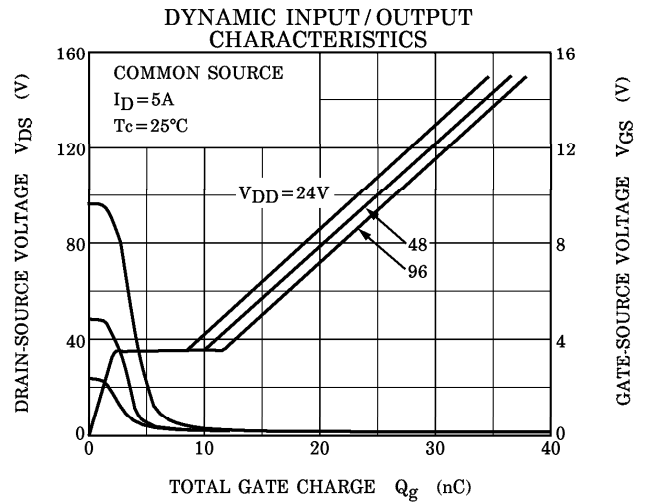
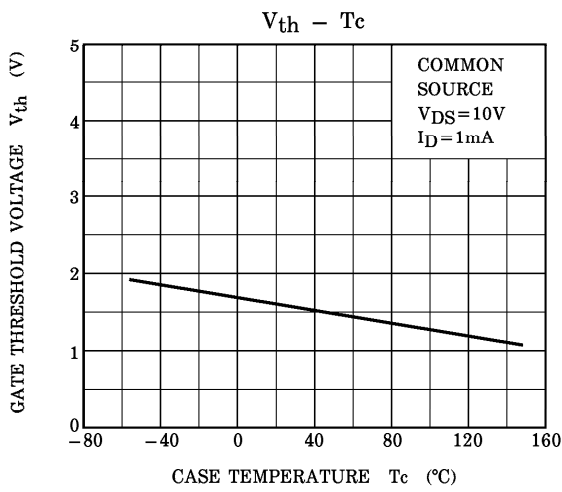
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

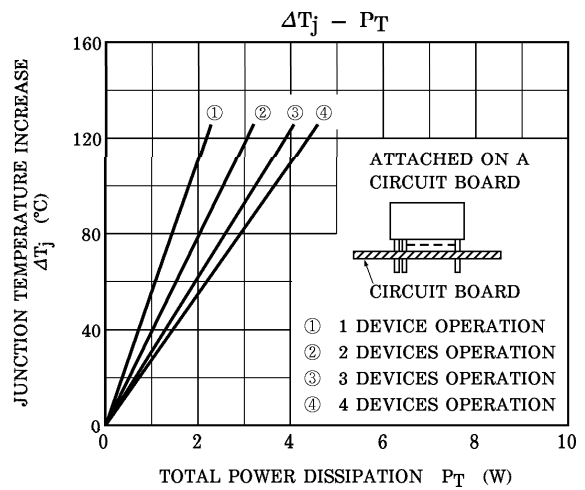
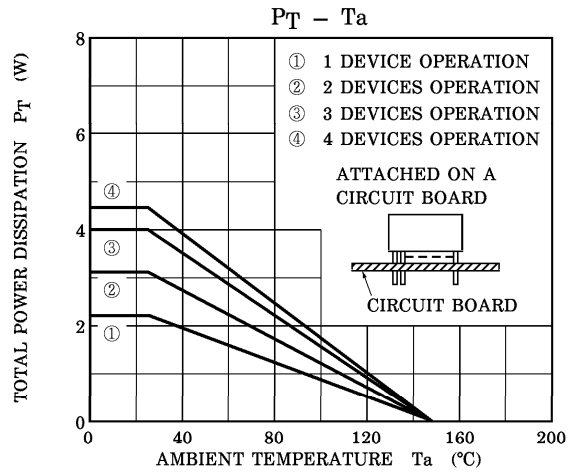
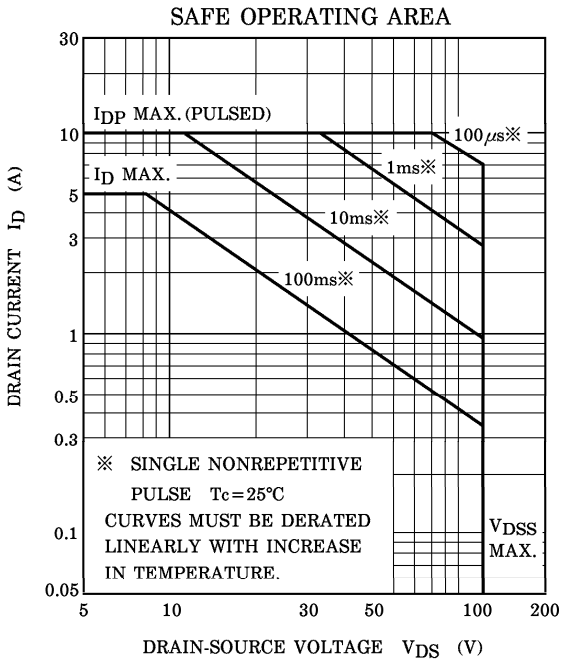
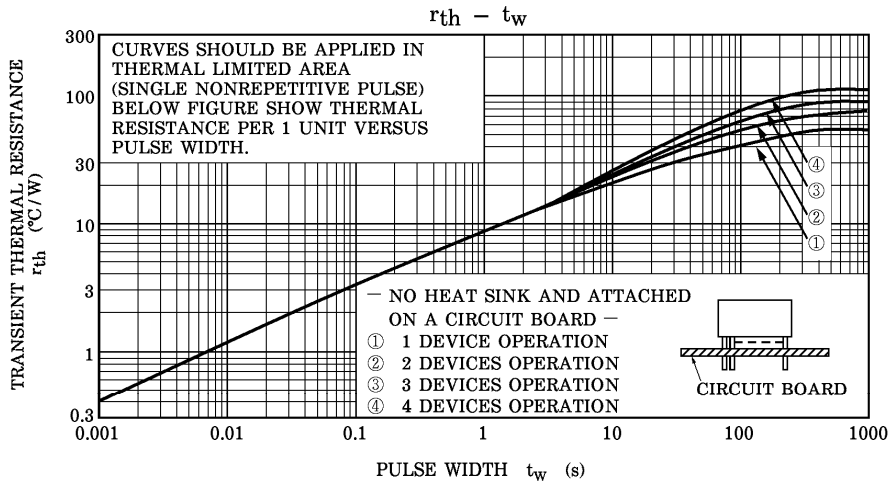
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------|-----------|---|------|------|------|---------|
| Drain Reverse Current | I_{DR} | — | — | — | 5 | A |
| Peak Drain Reverse Current | I_{DRP} | — | — | — | 10 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR}=5A, V_{GS}=0$ | — | -1.0 | -1.5 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR}=5A, V_{GS}=0,$ $dI_{DR}/dt = -50A/\mu s$ | — | 180 | — | ns |
| Reverse Recovery Charge | Q_{rr} | | — | 0.54 | — | μC |

FLYBACK-DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------|----------|----------------|------|------|------|---------|
| Maximum Forward Current | I_{FM} | — | — | — | 5 | A |
| Reverse Current | I_R | $V_R=120V$ | — | — | 0.4 | μA |
| Reverse Voltage | V_R | $I_R=100\mu A$ | 120 | — | — | V |
| Forward Voltage | V_F | $I_F=2A$ | — | — | 2.3 | V |







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