

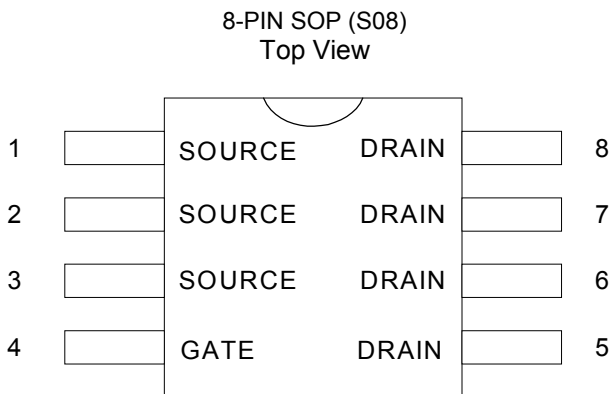
STRUCTURE

- ◆ Silicon N-channel MOSFET

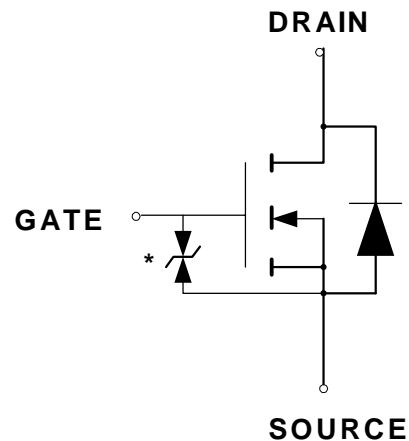
FEATURES

- ◆ Low Q_g
- ◆ Low on-resistance
- ◆ Excellent resistance to damage from static electricity

PIN CONFIGURATION



SYMBOL



N-Channel MOSFET

* Gate Protection Diode is included between the gate and the source terminals to protect the diode against static electricity when the product is in use. Use a protection circuit when the fixed voltage are exceeded.

ORDERING INFORMATION

| Part Number | Package |
|-------------|-----------------|
| CMT4410 | 8-PIN SOP (S08) |

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| Rating | Symbol | Value | Unit |
|---|-----------|------------|------------------|
| Drain-to-Source Voltage | V_{DS} | 30 | V |
| Drain to Current — Continuous (at 25°C) | I_D | 10 | A |
| — Pulsed* | I_{DP} | 40 | |
| Reverse Drain to Current — Continuous (at 25°C) | I_R | 10 | A |
| — Pulsed* | I_{DRP} | 40 | |
| Source Current (Body Diode) — Continuous (at 25°C) | I_S | 1.3 | A |
| — Pulsed* | I_{SP} | 5.2 | |
| Gate-to-Source Voltage — Continue | V_{GS} | ± 20 | V |
| Total Power Dissipation ($T_c = 25^\circ\text{C}$) | P_D | 2.0 | W |
| Storage Temperature Range | T_{STG} | -55 to 150 | $^\circ\text{C}$ |
| Channel Temperature | T_{ch} | 150 | $^\circ\text{C}$ |

* $P_w \leq 10\text{ms}$, Duty cycle $\leq 1\%$

THERMAL RESISTANCE ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Limits | Unit |
|--------------------|----------------|--------|--------------------|
| Channel to Ambient | $R_{th(ch-A)}$ | 62.5 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_a = 25^\circ\text{C}$.

| | | CMT4410 | | | |
|---|---|--------------|---------------|----------------|------------------|
| Characteristic | Symbol | Min | Typ | Max | Units |
| Drain-Source Breakdown Voltage ($V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$) | $V_{(BR)DSS}$ | 30 | | | V |
| Zero Gate Voltage Drain Current ($V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$) | I_{DSS} | | | 10 | $\mu\text{ A}$ |
| Gate-Source Leakage Current ($V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$) | I_{GSS} | | | ± 10 | $\mu\text{ A}$ |
| Gate Threshold Voltage ($V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$) | $V_{GS(th)}$ | 1.0 | | 2.5 | V |
| Static Drain-Source On-Resistance ($V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$) ($V_{GS} = 4.5\text{ V}$, $I_D = 10\text{ A}$) ($V_{GS} = 4.0\text{ V}$, $I_D = 10\text{ A}$) | $R_{DS(on)}$ | | 9 13 15 | 12 18 20 | $\text{m}\Omega$ |
| Forward Transfer Admittance ($V_{DS} = 10\text{ V}$, $I_D = 10\text{ A}$) * | $ Y_{FS} $ | 10 | | | mhos |
| Input Capacitance | $(V_{DS} = 10\text{ V}$, $f = 1\text{ MHz}$, $V_{GS} = 0\text{ V})^*$ | C_{iss} | 1750 | | pF |
| Output Capacitance | | C_{oss} | 950 | | pF |
| Reverse Transfer Capacitance | | C_{rss} | 450 | | pF |
| Turn-On Delay Time | $(V_{DD} = 15\text{ V}$, $I_D = 5\text{ A}$, $V_{GS} = 10\text{ V}$, $R_L = 3\Omega$, $R_{GS} = 10\Omega$) * | $t_{d(on)}$ | 20 | | ns |
| Rise Time | | t_r | 55 | | ns |
| Turn-Off Delay Time | | $t_{d(off)}$ | 100 | | ns |
| Fall Time | | t_f | 70 | | ns |
| Source-Drain Reverse Recovery Time ** | $I_F = 2.3\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$ | t_{rr} | 50 | 80 | ns |
| Total Gate Charge | $(V_{DD} = 15\text{ V}$, $I_D = 10\text{ A}$, $V_{GS} = 10\text{ V})^*$ | Q_g | 44.8 | 89.6 | nC |
| Gate-Source Charge | | Q_{gs} | 5.9 | | nC |
| Gate-Drain Charge | | Q_{gd} | 12.2 | | nC |

* Pulsed

BODY DIODE CHARACTERISTICS (SOURCE-DRAIN)

Unless otherwise specified, $T_a = 25^\circ\text{C}$.

| | | CMT4410 | | | |
|---|---|----------|-----|-----|-------|
| Characteristic | Symbol | Min | Typ | Max | Units |
| Forward Voltage ($V_{GS} = 0\text{ V}$, $I_S = 5.2\text{ A}$) * | V_{SD} | | | 1.5 | V |
| Reverse Recovery Time | $(V_{GS} = 0\text{ V}$, $I_{DR} = 5.2\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s})^*$ | t_{rr} | 240 | | ns |
| Reverse Recovery Charge | | Q_{rr} | 310 | | nC |

TYPICAL ELECTRICAL CHARACTERISTICS

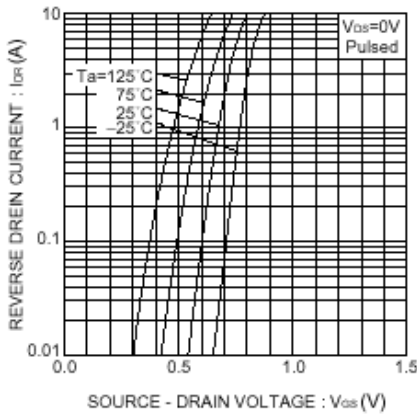


Fig.1 Reverse Drain Current vs. Source - Drain Voltage

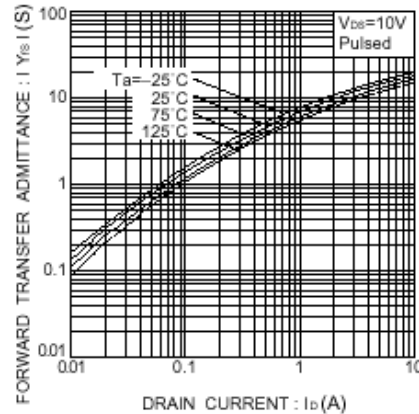


Fig.2 Forward Transfer Admittance vs. Drain Current

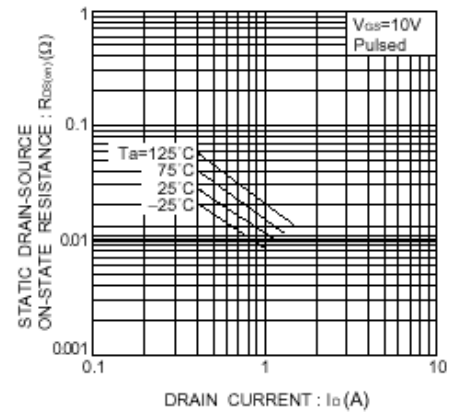


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current (I)

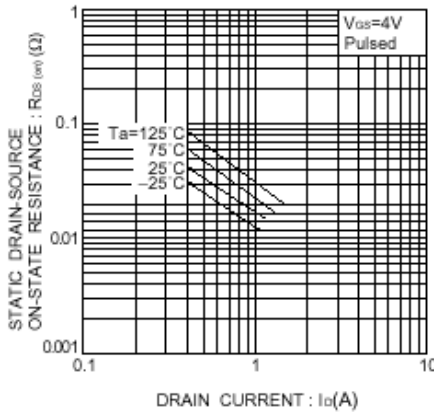


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current (II)

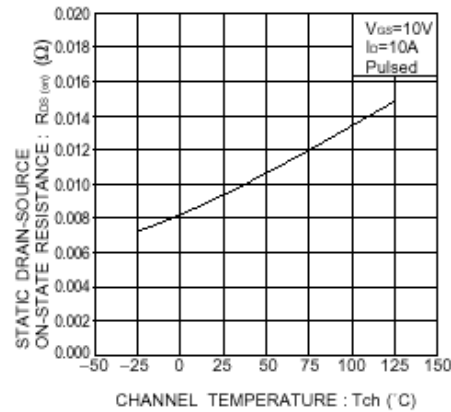


Fig.5 Static Drain-Source On-State Resistance vs. Channel Temperature

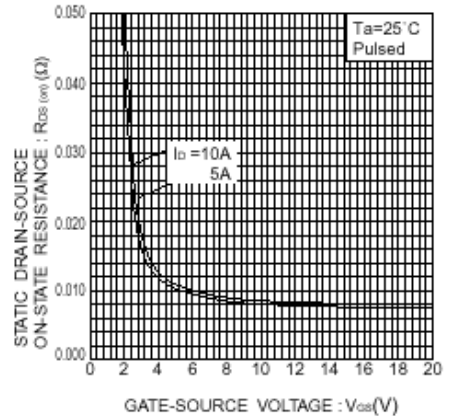


Fig.6 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

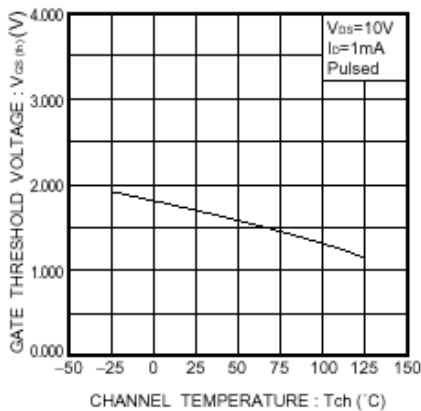


Fig.7 Gate Threshold Voltage vs. Channel Temperature

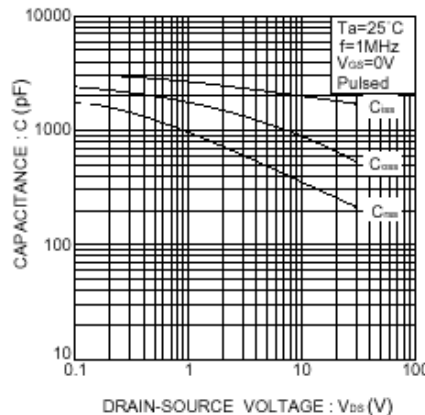


Fig.8 Typical Capacitance vs. Drain-Source Voltage

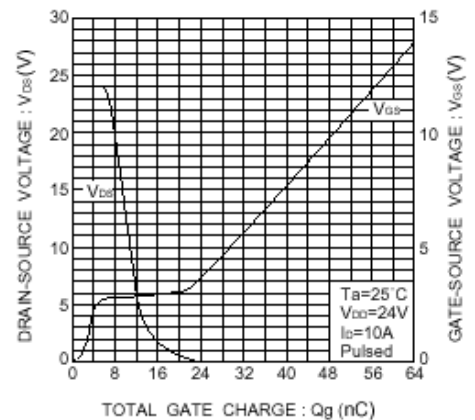


Fig.9 Dynamic Input Characteristics

TYPICAL ELECTRICAL CHARACTERISTICS (Conti.)

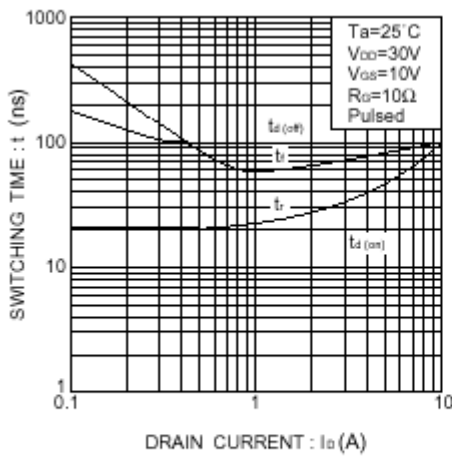


Fig.10 Switching Characteristics

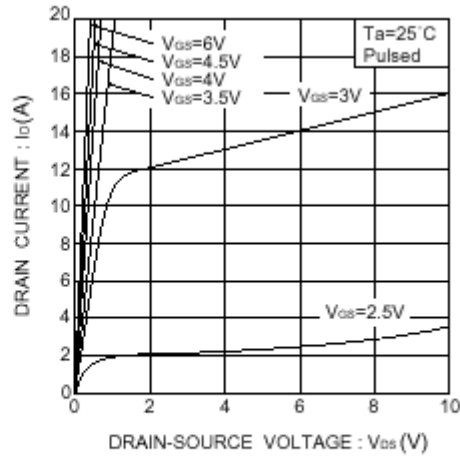


Fig.11 Typical Output Characteristics

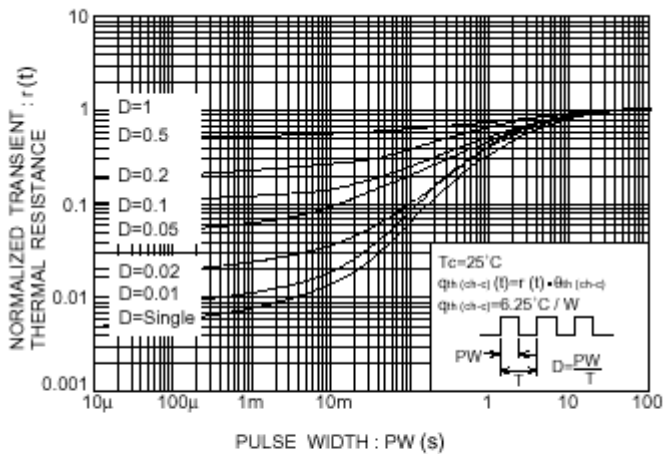
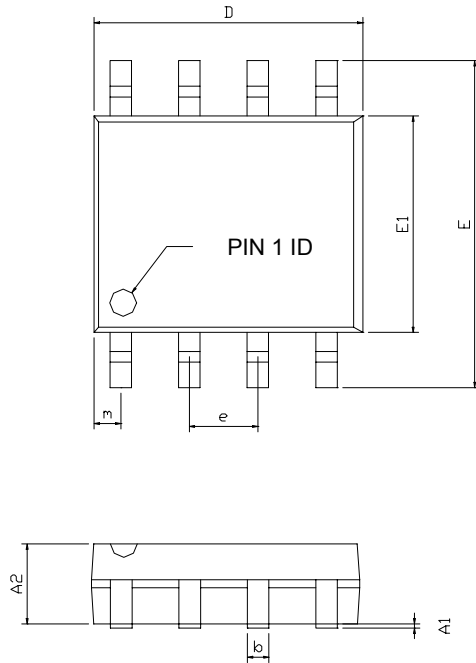
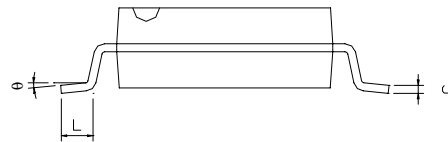


Fig.12 Normalized Transient Thermal Resistance vs. Pulse Width

PACKAGE DIMENSION**8-PIN SOP (S08)**

| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHS | | |
|---------|---------------------------|------|------|---------------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A1 | 0.10 | ---- | 0.25 | 0.004 | ---- | 0.010 |
| A2 | 1.40 | ---- | 1.55 | 0.055 | ---- | 0.061 |
| b | 0.30 | ---- | 0.51 | 0.012 | ---- | 0.020 |
| C | 0.15 | ---- | 0.26 | 0.006 | ---- | 0.010 |
| D | 4.60 | ---- | 5.06 | 0.169 | ---- | 0.199 |
| E | 5.79 | ---- | 6.20 | 0.228 | ---- | 0.244 |
| E1 | 3.76 | ---- | 4.01 | 0.148 | ---- | 0.158 |
| e | ---- | 1.27 | ---- | ---- | 0.050 | ---- |
| L | 0.38 | ---- | 0.69 | 0.015 | ---- | 0.035 |
| m | 0.43 | ---- | 0.69 | 0.017 | ---- | 0.027 |
| θ | 0° | ---- | 8° | 0° | ---- | 8° |



IMPORTANT NOTICE

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