

GENERAL DESCRIPTION

The CMT2301 is the P-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.

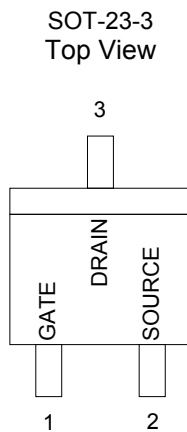
FEATURES

- ◆ -20V/-2.3A , $R_{DS(ON)}=130\text{ m}\Omega@V_{GS}=-4.5\text{V}$
- ◆ -20V/-1.9A , $R_{DS(ON)}=190\text{ m}\Omega@V_{GS}=-2.5\text{V}$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-23-3 package design

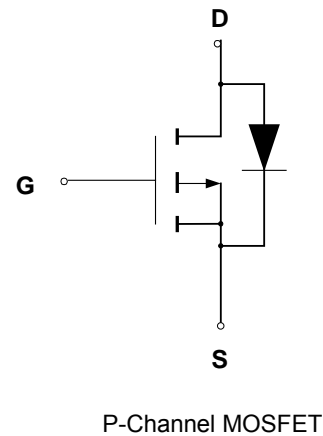
APPLICATIONS

- ◆ Power Management in Notebook
- ◆ Portable Equipment
- ◆ Battery Powered System
- ◆ DC/DC Converter
- ◆ Load Switch
- ◆ DSC
- ◆ LCD Display inverter

PIN CONFIGURATION



SYMBOL



ORDERING INFORMATION

| Part Number | Package |
|---------------|----------|
| CMT2301M233 | SOT-23-3 |
| CMT2301GM233* | SOT-23-3 |

*Note: G : Suffix for Pb Free Product

ABSOLUTE MAXIMUM RATINGS

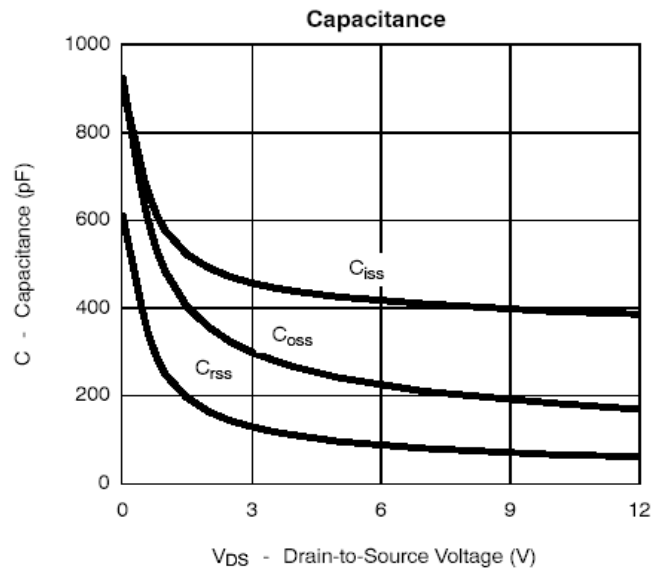
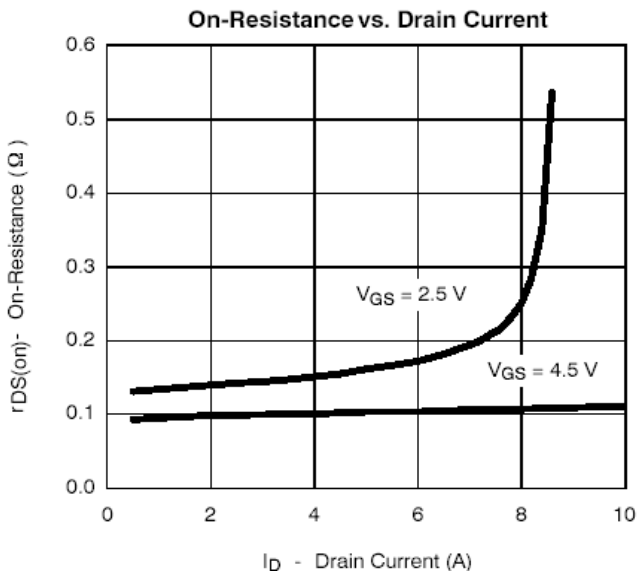
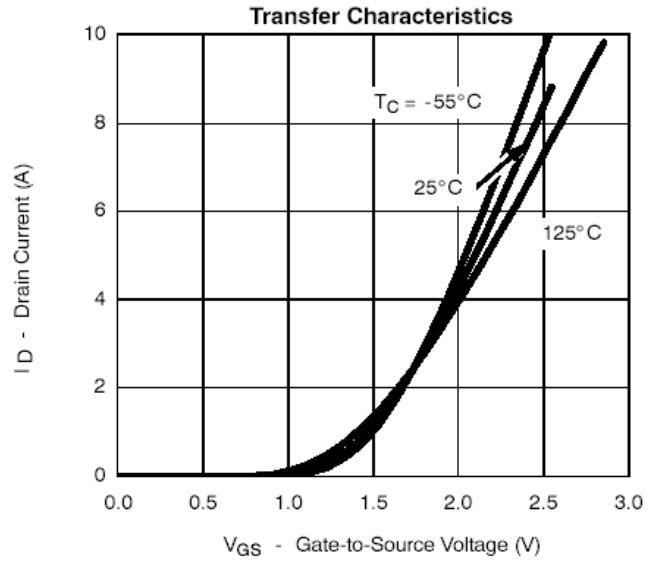
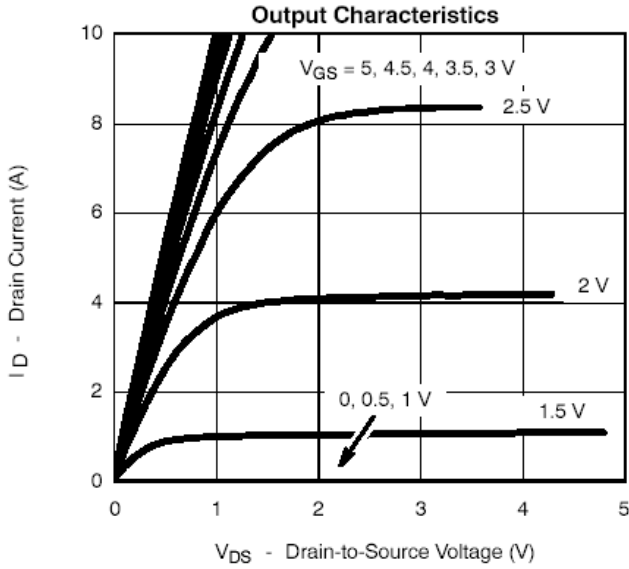
| Rating | Symbol | Value | Unit |
|---|-----------------|------------------------|--------------------|
| Drain- to- Source Voltage | V_{DSS} | -20 | V |
| Gate-to-Source Voltage | V_{GSS} | ± 8 | V |
| Continuous Drain Current($T_J=150^\circ\text{C}$) | I_D | $T_A=25^\circ\text{C}$ | -2.5 |
| | | $T_A=70^\circ\text{C}$ | -1.5 |
| Pulsed Drain Current | I_{DM} | -10 | A |
| Continuous Source Current(Diode Conduction) | I_S | -1.6 | A |
| Power Dissipation | P_D | $T_A=25^\circ\text{C}$ | 1.25 |
| | | $T_A=70^\circ\text{C}$ | 0.8 |
| Operating Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -55/150 | $^\circ\text{C}$ |
| Thermal Resistance-Junction to Ambient | $R_{\theta JA}$ | 120 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

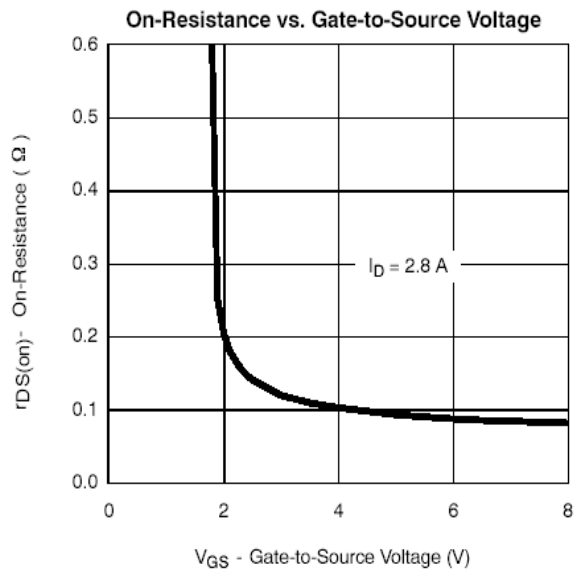
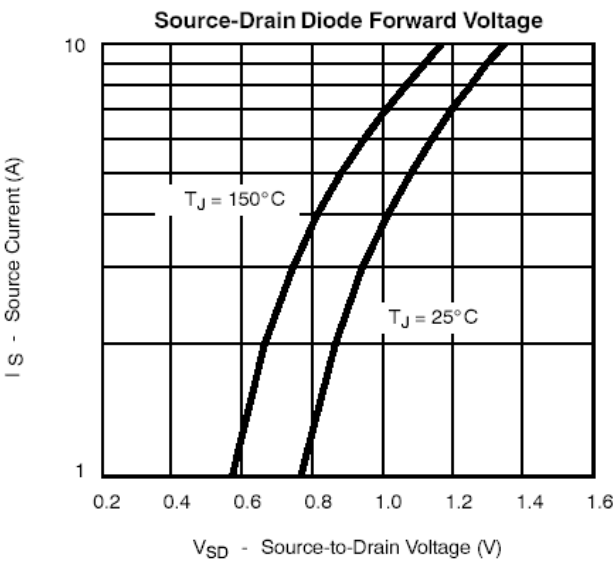
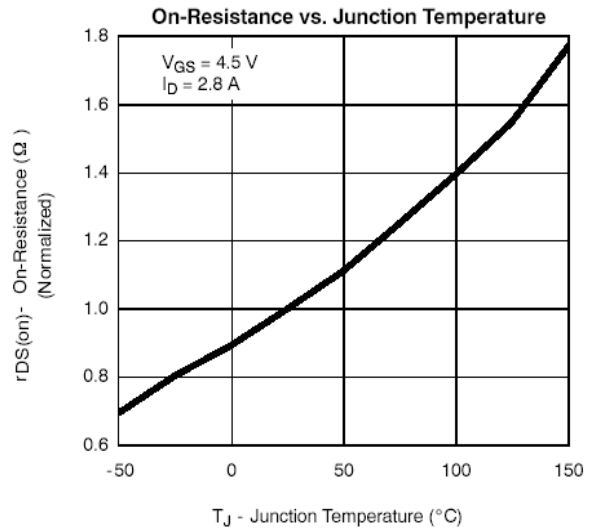
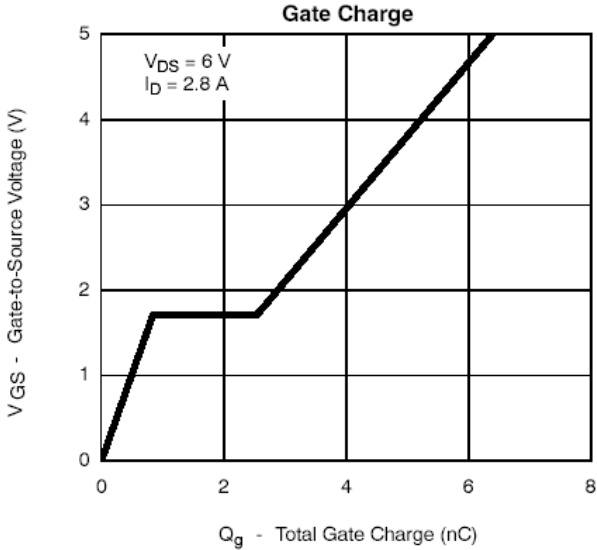
Unless otherwise specified, $T_J = 25^\circ\text{C}$.

| Characteristic | Symbol | CMT2301 | | | Units |
|---|--|--------------|----------------|--------------|---------------|
| | | Min | Typ | Max | |
| Static | | | | | |
| Drain-Source Breakdown Voltage ($V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$) | $V_{(BR)DSS}$ | -20 | | | V |
| Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$) | $V_{GS(th)}$ | -0.45 | | -1.5 | V |
| Gate Leakage Current ($V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$) | I_{GSS} | | | ± 100 | nA |
| Zero Gate Voltage Drain Current ($V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$) ($V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$) | I_{DSS} | | | -1 -10 | μA |
| On-State Drain Current ($V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{V}$) ($V_{DS} \leq -5\text{ V}, V_{GS} = -2.5\text{V}$) | $I_{D(on)}$ | -6 -3 | | | A |
| Drain-Source On-Resistance ($V_{GS} = -4.5\text{ V}, I_D = -2.8\text{A}$) ($V_{GS} = -2.5\text{ V}, I_D = -2.0\text{A}$) | $R_{DS(on)}$ | | 0.105 0.145 | 0.13 0.19 | Ω |
| Forward Transconductance ($V_{DS} = -5\text{ V}, I_D = -2.8\text{V}$) | g_{FS} | | 6.5 | | S |
| Diode Forward Voltage ($I_S = -1.6\text{A}, V_{GS} = 0\text{V}$) | V_{SD} | | -0.8 | -1.2 | V |
| Dynamic | | | | | |
| Input Capacitance | $(V_{DS} = -6\text{ V}, V_{GS} = -0\text{V}, f = 1.0\text{ MHz})$ | C_{iss} | 415 | | pF |
| Output Capacitance | | C_{oss} | 223 | | |
| Reverse Transfer Capacitance | | C_{rss} | 87 | | |
| Turn-On Time | $(V_{DD} = -6\text{ V}, R_L = 6\Omega, I_D = -1.0\text{ A}, V_{GEN} = -4.5\text{ V}, R_G = 6\Omega)$ | $t_{d(on)}$ | 13 | 25 | ns |
| Turn-Off Time | | t_r | 36 | 60 | |
| | | $t_{d(off)}$ | 42 | 70 | |
| | | t_f | 34 | 60 | |
| Total Gate Charge | $(V_{DS} = -6\text{ V}, I_D = -2.8\text{ A}, V_{GS} = -4.5\text{V})$ | Q_g | 5.8 | 10 | nC |
| Gate-Source Charge | | Q_{gs} | 0.85 | | |
| Gate-Drain Charge | | Q_{gd} | 1.7 | | |

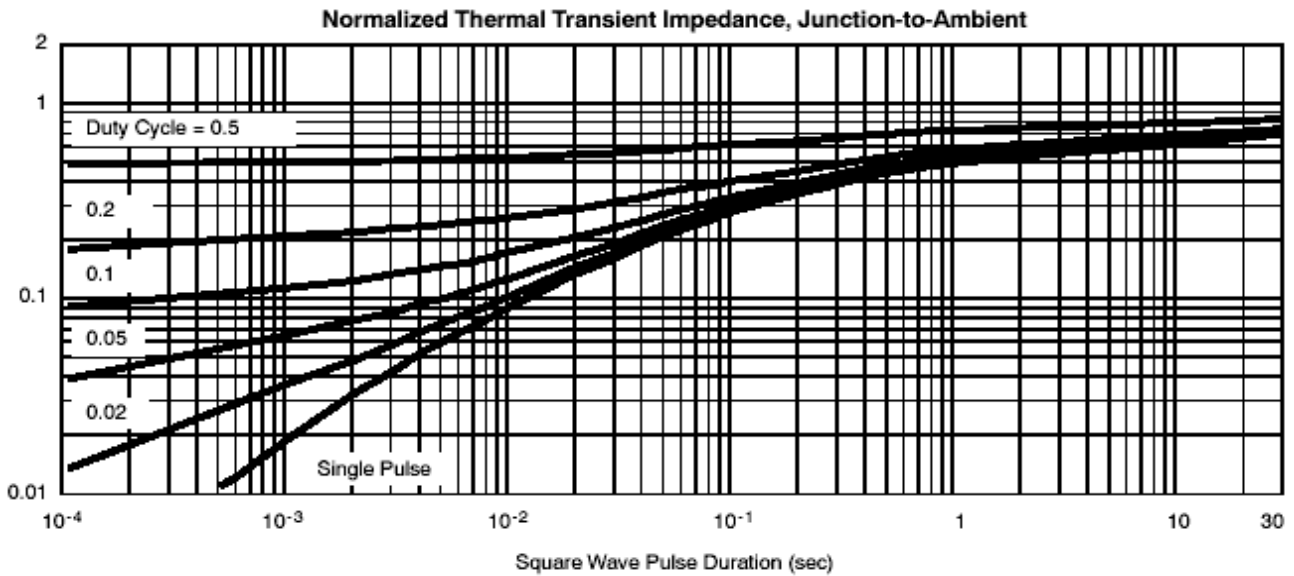
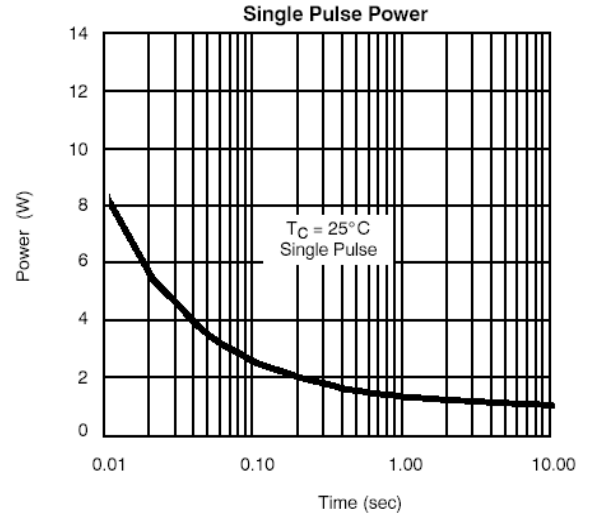
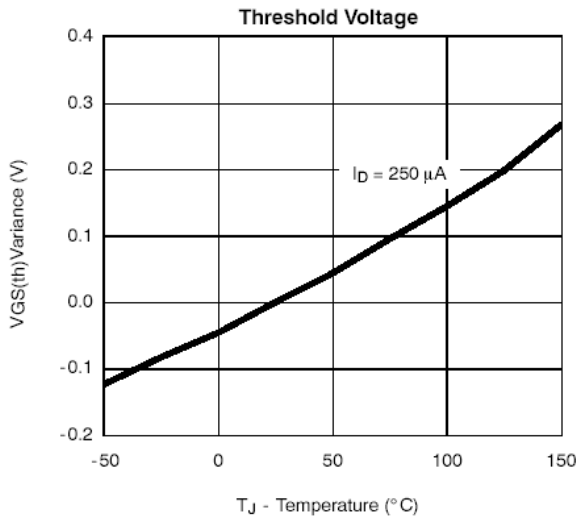
TYPICAL CHARACTERISTICS



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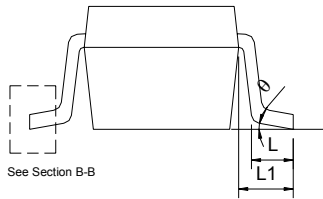
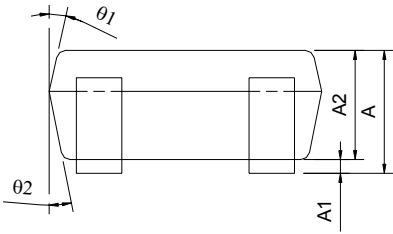
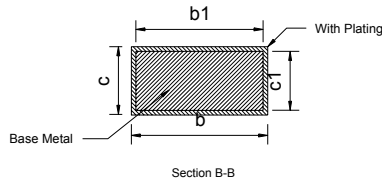
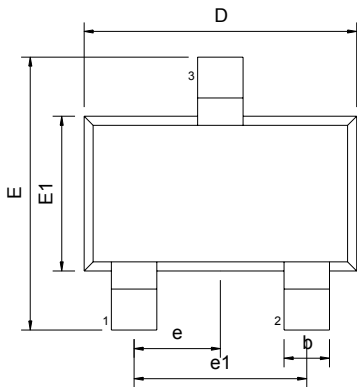


TYPICAL CHARACTERISTICS



PACKAGE DIMENSION

SOT-23-3



| SYMBOLS | DIMENSIONS IN MILLIMETERS | | | DIMENSIONS IN INCHS | | |
|---------|---------------------------|------|------|---------------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.05 | --- | 1.35 | 0.041 | --- | 0.053 |
| A1 | 0.05 | --- | 0.15 | 0.002 | --- | 0.006 |
| A2 | 1.00 | 1.10 | 1.20 | 0.039 | 0.043 | 0.047 |
| b | 0.25 | --- | 0.50 | 0.010 | --- | 0.020 |
| b1 | 0.25 | 0.40 | 0.45 | 0.010 | 0.016 | 0.018 |
| c | 0.08 | --- | 0.20 | 0.003 | --- | 0.008 |
| c1 | 0.08 | 0.11 | 0.15 | 0.003 | 0.004 | 0.006 |
| D | 2.70 | 2.90 | 3.00 | 0.106 | 0.114 | 0.118 |
| E | 2.60 | 2.80 | 3.00 | 0.102 | 0.110 | 0.118 |
| E1 | 1.50 | 1.60 | 1.70 | 0.059 | 0.063 | 0.067 |
| L | 0.35 | 0.45 | 0.55 | 0.014 | 0.018 | 0.022 |
| L1 | 0.60 REF | | | 0.024 REF | | |
| e | 0.95 BSC | | | 0.037 BSC | | |
| e1 | 1.90 BSC | | | 0.075 BSC | | |
| theta | 0° | 5° | 10° | 0° | 5° | 10° |
| theta1 | 3° | 5° | 7° | 3° | 5° | 7° |
| theta2 | 6° | 8° | 10° | 6° | 8° | 10° |
| | | | | | | |
| | | | | | | |

IMPORTANT NOTICE

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HsinChu Headquarter

5F, No. 11, Park Avenue II,
Science-Based Industrial Park,
HsinChu City, Taiwan
TEL: +886-3-567 9979
FAX: +886-3-567 9909

Sales & Marketing

11F, No. 306-3, SEC. 1, Ta Tung Road,
Hsichih, Taipei Hsien 221, Taiwan
TEL: +886-2-8692 1591
FAX: +886-2-8692 1596
