

### GENERAL DESCRIPTION

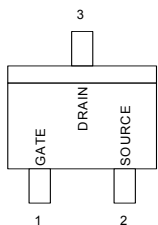
This N-Channel enhancement mode field effect transistor is produced using high cell density, DMOS technology. These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance. It can be used in most applications requiring up to 115mA DC and can deliver pulsed currents up to 800mA. This product is particularly suited for low voltage, low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

### FEATURES

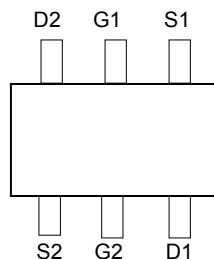
- ◆ High Density Cell Design for Low  $R_{DS(ON)}$
- ◆ Voltage Controlled Small Signal Switch
- ◆ Rugged and Reliable
- ◆ High Saturation Current Capability

### PIN CONFIGURATION

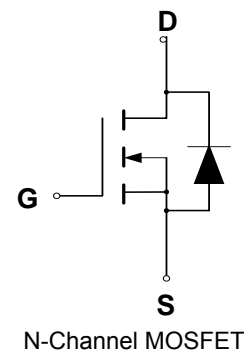
SOT-23, SOT-323  
Top View



SOT-363  
Top View



### SYMBOL



### ORDERING INFORMATION

Part Number	Package
CMT2N7002	SOT-23
CMT2N7002G*	SOT-23
CMT2N7002WG*	SOT-323
CMT2N7002DWG*	SOT-363
CMT2N7002X*	SOT-23
CMT2N7002WX*	SOT-323
CMT2N7002DWX*	SOT-363

\***Note:** G : Suffix for Pb Free Product    W: Suffix for Package SOT-323    X : Suffix for Halogen Free Product

### ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain Source Voltage	$V_{DSS}$	60	V
Drain-Gate Voltage ( $R_{GS} = 1.0M\Omega$ )	$V_{DGR}$	60	V
Drain to Current – Continuous	$I_D$	115	mA
– Pulsed	$I_{DM}$	800	
Gate-to-Source Voltage – Continue	$V_{GS}$	$\pm 20$	V
– Non-repetitive	$V_{GSM}$	$\pm 40$	V
Total Power Dissipation	$P_D$	225	mW
Derate above 25°C		1.8	mW/°C
Single Pulse Drain-to-Source Avalanche Energy – $T_J = 25^\circ C$ ( $V_{DD} = 50V, V_{GS} = 10V, I_{AS} = 0.8A, L = 30mH, R_G = 25\Omega$ )	$E_{AS}$	9.6	mJ
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	°C
Thermal Resistance – Junction to Ambient	$\theta_{JA}$	417	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	$T_L$	300	°C

### ELECTRICAL CHARACTERISTICS

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

Characteristic	Symbol	CMT2N7002			Units
		Min	Typ	Max	
Drain-Source Breakdown Voltage ( $V_{GS} = 0\text{ V}$ , $I_D = 10\ \mu\text{A}$ )	$V_{(BR)DSS}$	60			V
Drain-Source Leakage Current ( $V_{DS} = 60\text{ V}$ , $V_{GS} = 0\text{ V}$ ) ( $V_{DS} = 60\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 125^\circ\text{C}$ )	$I_{DSS}$			1.0 0.5	$\mu\text{A}$ mA
Gate-Source Leakage Current-Forward ( $V_{gsf} = 20\text{ V}$ )	$I_{GSSF}$			100	nA
Gate-Source Leakage Current-Reverse ( $V_{gsf} = -20\text{ V}$ )	$I_{GSSF}$			-100	nA
Gate Threshold Voltage * ( $V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$ )	$V_{GS(th)}$	1.0		2.5	V
On-State Drain Current ( $V_{DS} \geq 2.0\ V_{DS(on)}$ , $V_{GS} = 10\text{V}$ )	$I_{d(on)}$	500			mA
Static Drain-Source On-Resistance * ( $V_{GS} = 10\text{ V}$ , $I_D = 0.5\text{A}$ ) ( $V_{GS} = 10\text{ V}$ , $I_D = 0.5\text{A}$ , $T_J = 125^\circ\text{C}$ ) ( $V_{GS} = 5.0\text{ V}$ , $I_D = 50\text{mA}$ ) ( $V_{GS} = 5.0\text{ V}$ , $I_D = 50\text{mA}$ , $T_J = 125^\circ\text{C}$ )	$R_{DS(on)}$			7.5 13.5 7.5 13.5	$\Omega$
Drain-Source On-Voltage * ( $V_{GS} = 10\text{ V}$ , $I_D = 0.5\text{A}$ ) ( $V_{GS} = 5.0\text{ V}$ , $I_D = 50\text{mA}$ )	$V_{DS(on)}$			3.75 0.375	V
Forward Transconductance ( $V_{DS} \geq 2.0\ V_{DS(on)}$ , $I_D = 200\text{mA}$ ) *	$g_{FS}$	80			mmhos
Input Capacitance	( $V_{DS} = 25\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{iss}$		50	pF
Output Capacitance		$C_{oss}$		25	pF
Reverse Transfer Capacitance		$C_{rss}$		5.0	pF
Turn-On Delay Time	( $V_{DD} = 25\text{ V}$ , $I_D = 500\text{ mA}$ , $V_{gen} = 10\text{ V}$ , $R_G = 25\Omega$ , $R_L = 50\Omega$ ) *	$t_{d(on)}$		20	ns
Turn-Off Delay Time		$t_{d(off)}$		40	ns
Diode Forward On-Voltage ( $I_S = 115\text{ mA}$ , $V_{GS} = 0\text{V}$ )	$V_{SD}$			-1.5	V
Source Current Continuous (Body Diode)	$I_S$			-115	mA
Source Current Pulsed	$I_{SM}$			-800	mA

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

**TYPICAL ELECTRICAL CHARACTERISTICS**

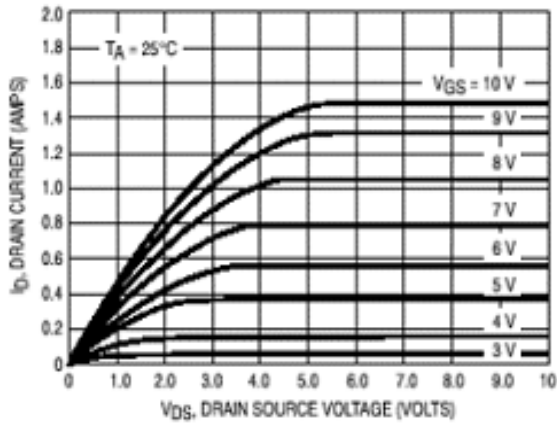


Figure 1. Ohmic Region

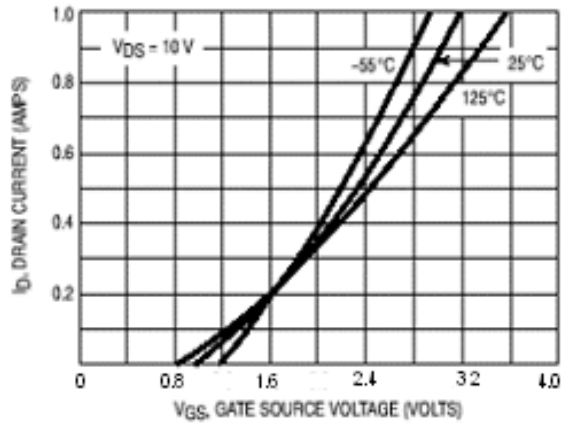


Figure 2. Transfer Characteristics

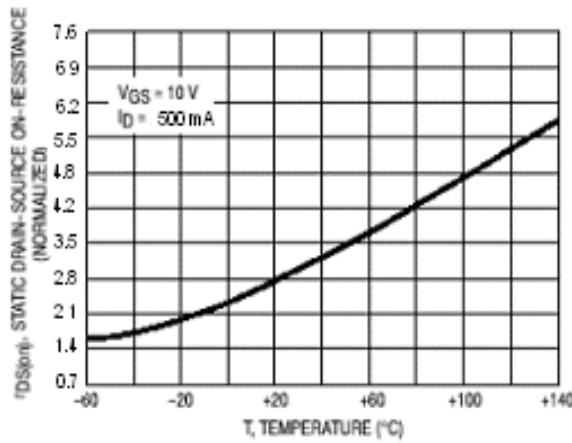


Figure 3. Temperature versus Static Drain-Source On-Resistance

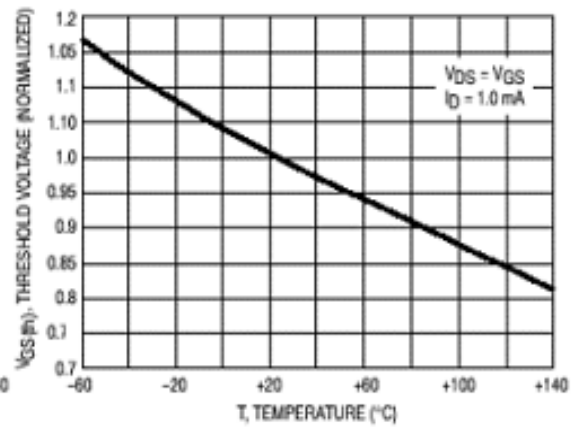


Figure 4. Temperature versus Gate Threshold Voltage

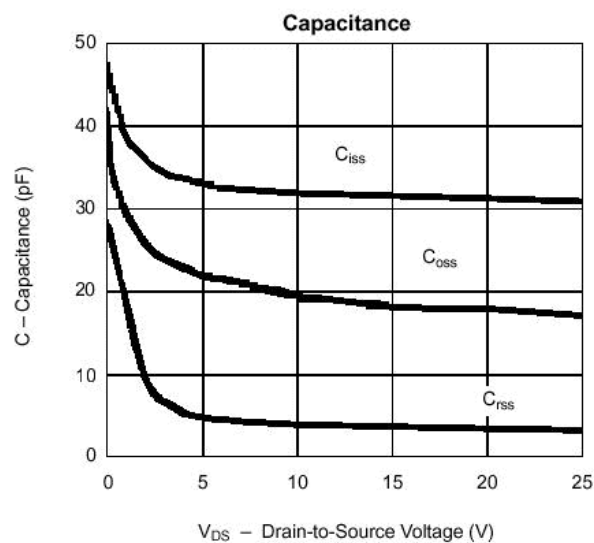


Figure 5. Capacitance

### PACKAGE DIMENSION

#### SOT-23

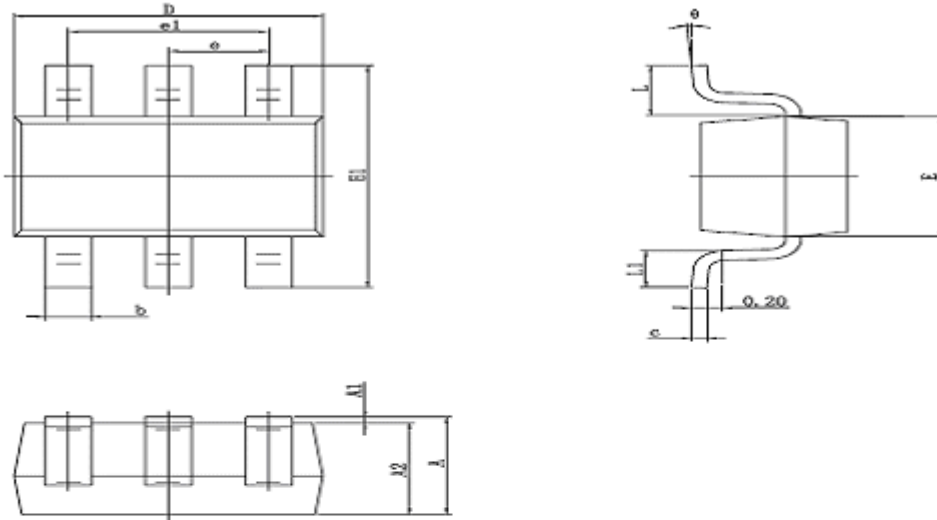
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°

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#### SOT-323

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	---	1.10	0.035	---	0.043
A1	0.00	---	0.10	0.000	---	0.004
A2	0.90	---	1.00	0.035	---	0.039
b	0.25	---	0.50	0.010	---	0.020
b1	0.25	---	0.45	0.010	---	0.018
c	0.08	---	0.20	0.003	---	0.008
c1	0.08	---	0.15	0.003	---	0.006
D	2.00	---	2.20	0.079	---	0.087
E	2.15	---	2.45	0.085	---	0.096
E1	1.15	---	1.35	0.045	---	0.053
L	0.26	---	0.46	0.010	---	0.018
L1	0.525 REF			0.021 REF		
e	0.65 TYP			0.026 TYP		
e1	1.20	---	1.40	0.047	---	0.055
θ	0°	---	8°	0°	---	8°

### SOT-363



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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## IMPORTANT NOTICE

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