GENERAL DESCRIPTION

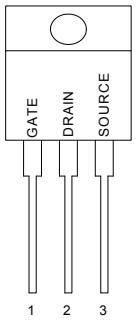
This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits.

FEATURES

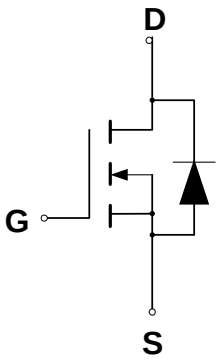
- Higher Current Rating
- Lower Rds(on)
- Lower Capacitances
- Lower Total Gate Charge
- Tighter VSD Specifications
- Avalanche Energy Specified

PIN CONFIGURATION

TO-220/TO-220FP
Top View



SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — Continuous	I_D	4.0	A
— Pulsed	I_{DM}	14	
Gate-to-Source Voltage — Continue	V_{GS}	±30	V
— Non-repetitive	V_{GSM}	±40	V
Total Power Dissipation	P_D		W
TO-220		83	
TO-220FP		30	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	℃
Single Pulse Drain-to-Source Avalanche Energy — T_J = 25℃ (V_{DD} = 100V, V_{GS} = 10V, I_L = 4A, L = 10mH, R_G = 25Ω)	E_{AS}	80	mJ
Thermal Resistance — Junction to Case	θ_{JC}	1.30	℃/W
— Junction to Ambient	θ_{JA}	100	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	℃

ORDERING INFORMATION

Part Number	Package
CMT04N60GN220*	TO-220
CMT04N60XN220*	TO-220
CMT04N60GN220FP*	TO-220 Full Package
CMT04N60XN220FP*	TO-220 Full Package

***Note:** G : Suffix for Pb Free Product
X : Suffix for Halogen and Pb Free Product

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃.

			CMT04N60			
Characteristic		**Symbol**	**Min**	**Typ**	**Max**	**Units**
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = 250 μA)		$V_{(BR)DSS}$	600			V
Drain-Source Leakage Current (V_{DS} =600 V, V_{GS} = 0 V)		I_{DSS}			1	uA
Gate-Source Leakage Current-Forward (V_{gsf} = 30 V, V_{DS} = 0 V)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse (V_{gsr} = - 30 V, V_{DS} = 0 V)		I_{GSSR}			100	nA
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μA)		$V_{GS(th)}$	2.0		4.0	V
Static Drain-Source On-Resistance (V_{GS} = 10 V, I_D = 2.0A) *		$R_{DS(on)}$			2.2	Ω
Forward Transconductance (V_{DS} = 50 V, I_D = 2.0 A) *		g_{FS}	2.5			mhos
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz)	C_{iss}		540	760	pF
Output Capacitance		C_{oss}		125	180	pF
Reverse Transfer Capacitance		C_{rss}		8.0	20	pF
Turn-On Delay Time	(V_{DD} = 300 V, I_D = 4.0 A, V_{GS} = 10 V, R_G = 9.1Ω) *	$t_{d(on)}$		12	20	ns
Rise Time		t_r		7.0	10	ns
Turn-Off Delay Time		$t_{d(off)}$		19	40	ns
Fall Time		t_f		10	20	ns
Total Gate Charge	(V_{DS} = 480 V, I_D = 4.0 A, V_{GS} = 10 V)*	Q_g		5.0	10	nC
Gate-Source Charge		Q_{gs}		2.7		nC
Gate-Drain Charge		Q_{gd}		2.0		nC
Internal Drain Inductance (Measured from the drain lead 0.25” from package to center of die)		L_D		4.5		nH
Internal Drain Inductance (Measured from the source lead 0.25” from package to source bond pad)		L_S		7.5		nH
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	(I_S = 4.0 A, d_{IS}/d_t = 100A/μs)	V_{SD}			1.5	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		655		ns

* Pulse Test: Pulse Width ≦300μs, Duty Cycle ≦2%
** Negligible, Dominated by circuit inductance

TYPICAL CHARACTERISTICS

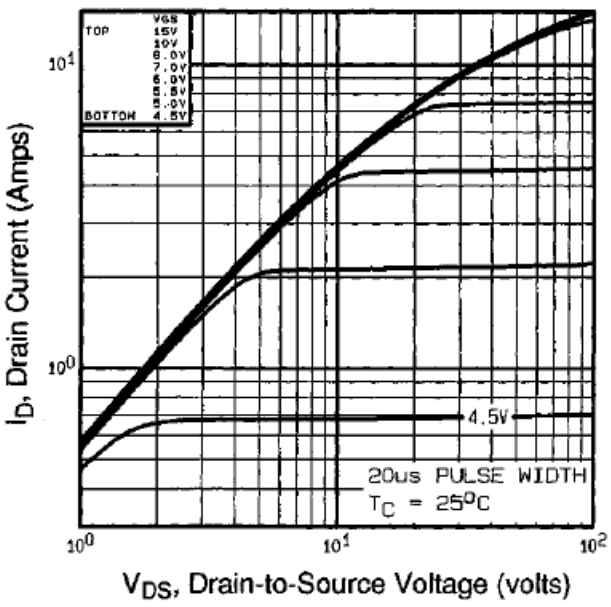


Fig 1. Typical Output Characteristics, T_C=25°C

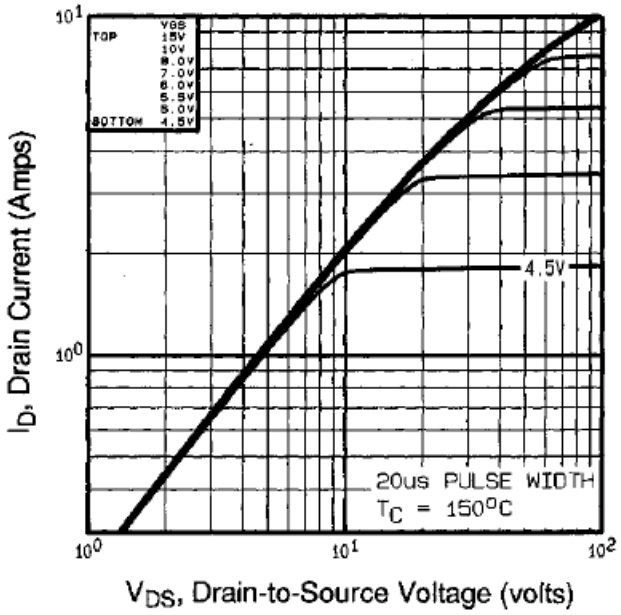


Fig 2. Typical Output Characteristics, T_C=150°C

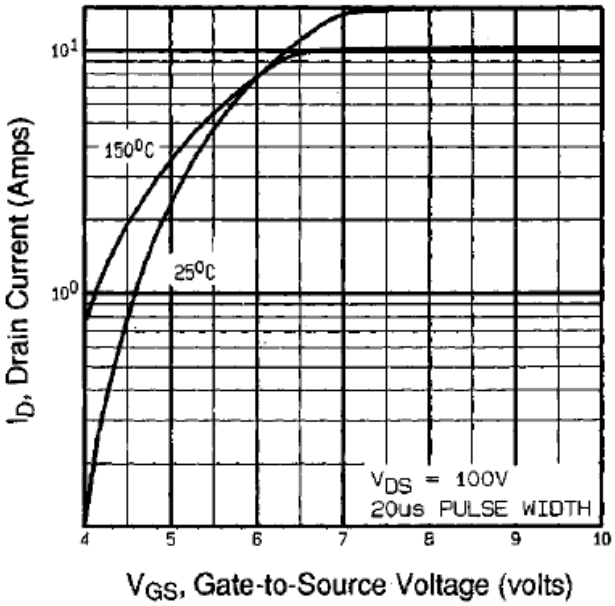


Fig 3. Typical Transfer Characteristics

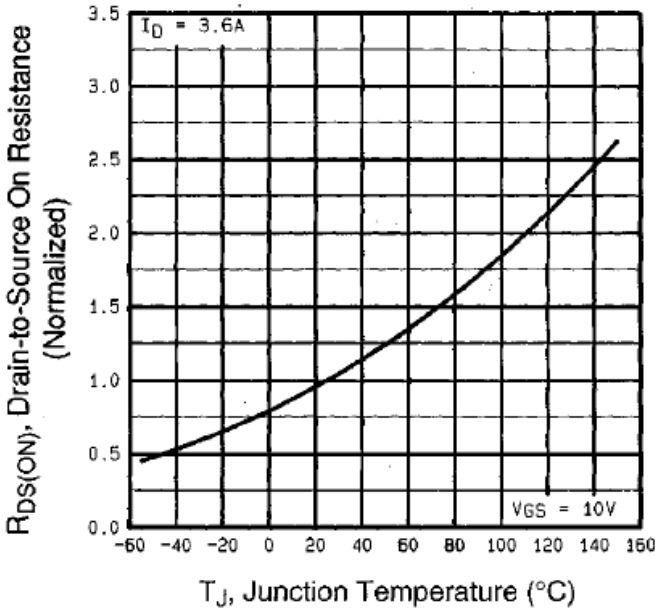


Fig 4. Normalized On-Resistance Vs. Temperature

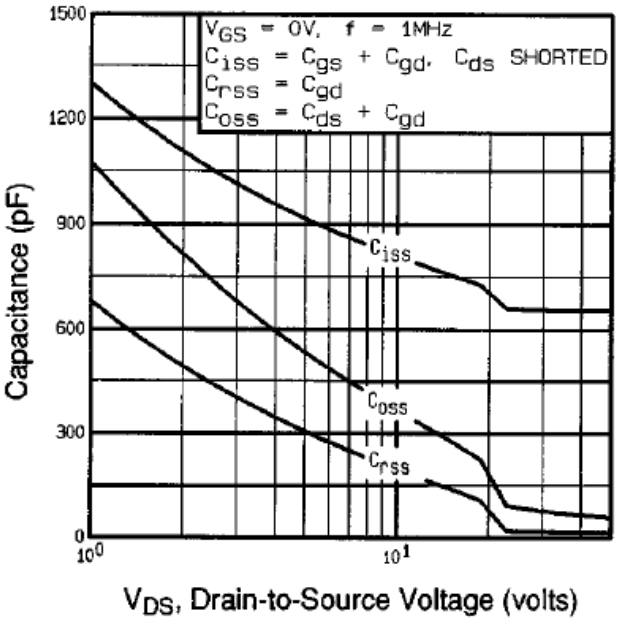


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

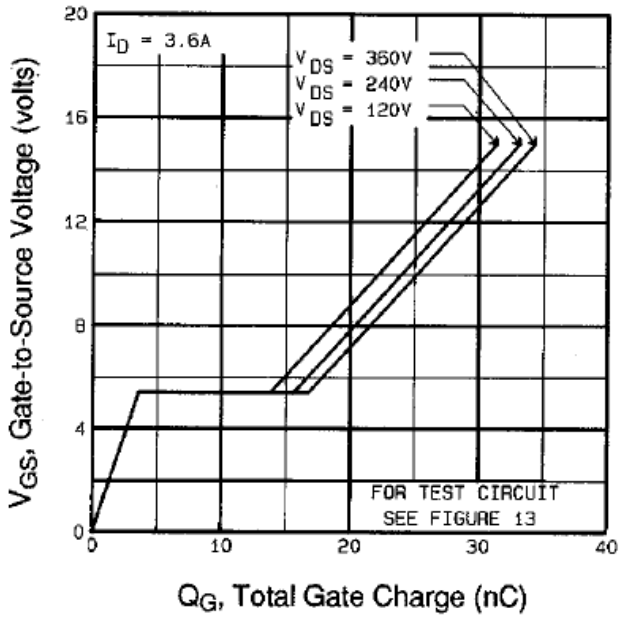


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

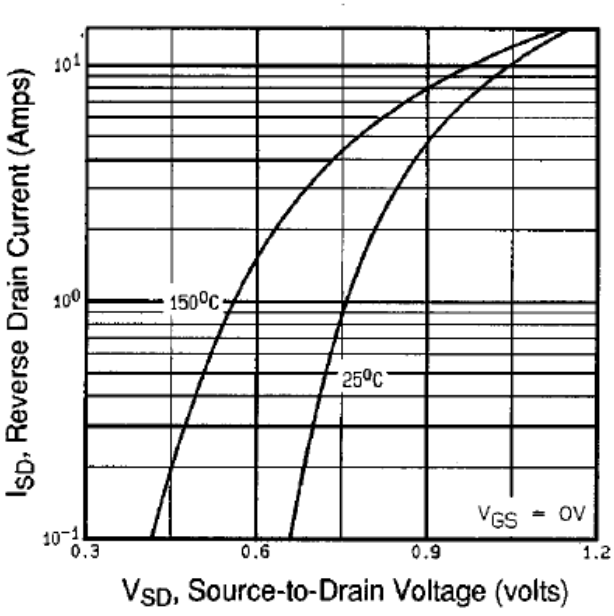


Fig 7. Typical Source-Drain Diode Forward Voltage

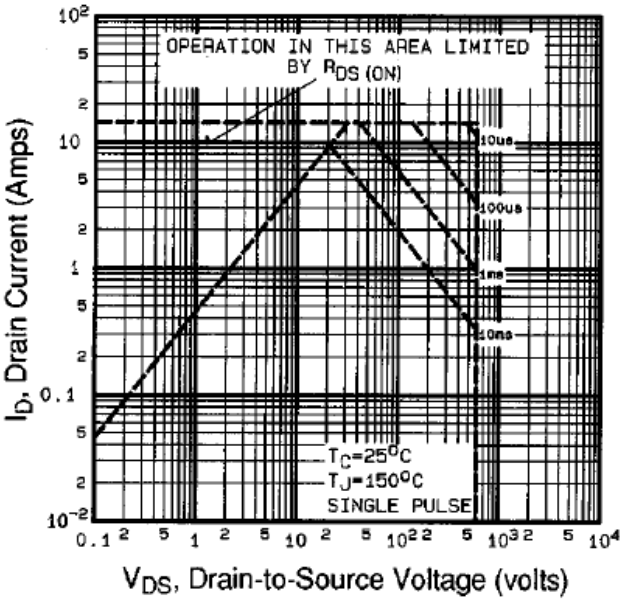
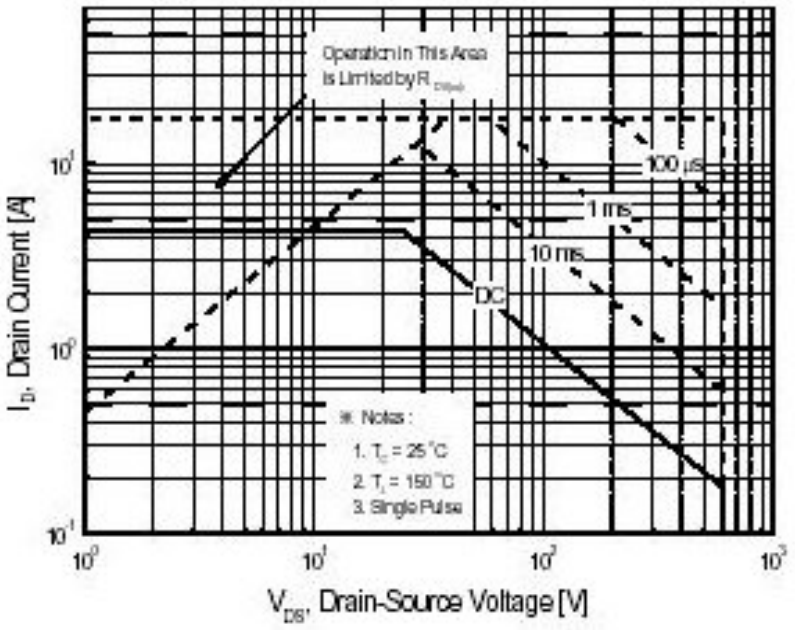
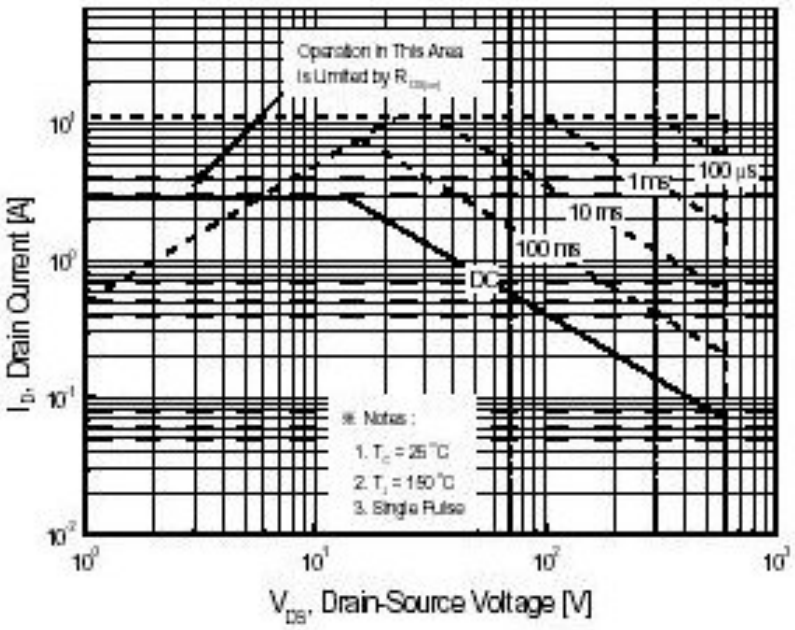


Fig 8. Maximum Safe Operating Area



Maximum Safe Operating Area

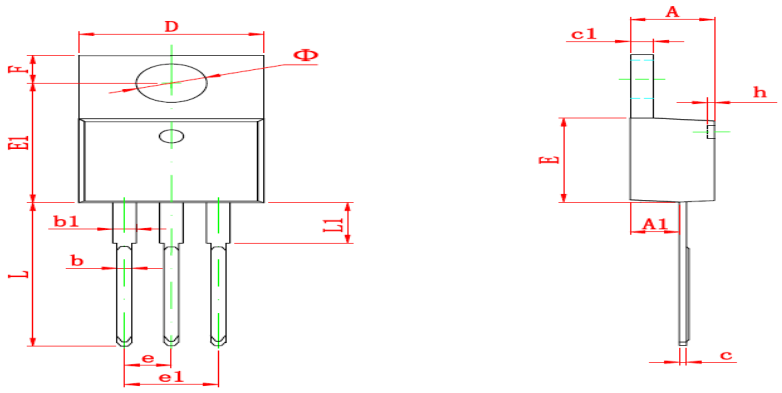
TO-220



Maximum Safe Operating Area

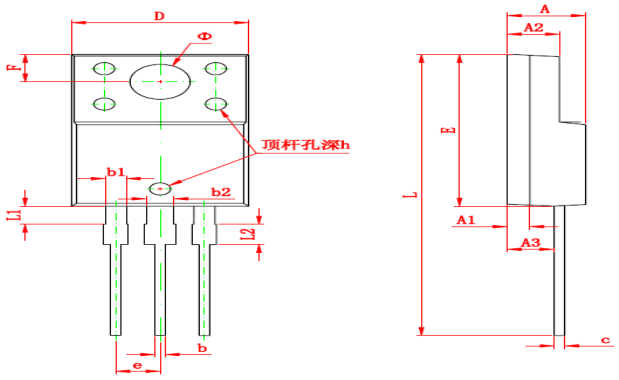
PACKAGE DIMENSION

TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155

TO-220FP



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.300	4.700	0.169	0.185
A1	1.300 REF		0.051 REF	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.500	0.750	0.020	0.030
b1	1.100	1.350	0.043	0.053
b2	1.500	1.750	0.059	0.069
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP		0.100 TYP	
F	2.700 REF		0.106 REF	
Φ	3.500 REF		0.138 REF	
h	0.000	0.300	0.000	0.012
L	28.000	28.400	1.102	1.118
L1	1.700	1.900	0.067	0.075
L2	1.900	2.100	0.075	0.083

IMPORTANT NOTICE

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