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CMT18N20

POWER FIELD EFFECT TRANSISTOR

GENERAL DESCRIPTION

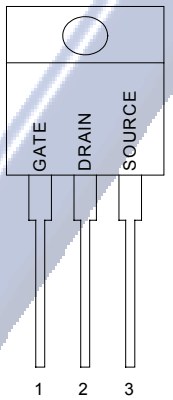
This Power MOSFET is designed for low voltage, high speed power switching applications such as switching regulators, converters, solenoid and relay drivers.

FEATURES

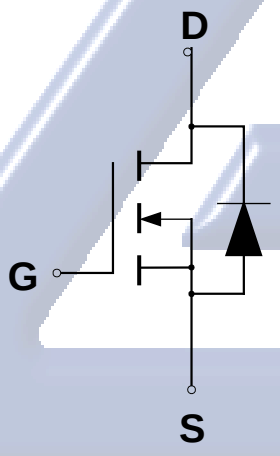
- Silicon Gate for Fast Switching Speeds
- Low $R_{DS(on)}$ to Minimize On-Losses. Specified at Elevated Temperature
- Rugged – SOA is Power Dissipation Limited
- Source-to-Drain Characterized for Use With Inductive Loads

PIN CONFIGURATION

TO-220
Front View



SYMBOL



N-Channel MOSFET

ORDERING INFORMATION

Part Number	Package
CMT18N20N220	TO-220

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ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current — Continuous	I_D	18	A
— Pulsed	I_{DM}	72	
Gate-to-Source Voltage — Continue	V_{GS}	±20	V
— Non-repetitive	V_{GSM}	±40	V
Total Power Dissipation	P_D	125	W
Derate above 25℃		1.00	W/℃
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 = 18A, L = 1.38mH, R_G = 25Ω)	E_{AS}	224	mJ
Thermal Resistance — Junction to Case	θ_{JC}	1.00	℃/W
— Junction to Ambient	θ_{JA}	62.5	
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	℃

(1) Pulse Width and frequency is limited by TJ(max) and thermal response

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CHAMPION

CMT18N20

POWER FIELD EFFECT TRANSISTOR

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃.

Characteristic		Symbol	CMT18N20 Min	Typ	Max	Units
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = 250 μA)		$V_{(BR)DSS}$	200			V
Drain-Source Leakage Current (V_{DS} = Rated V_{DSS}, V_{GS} = 0 V)		I_{DSS}			0.025	mA
(V_{DS} = 0.8Rated V_{DSS}, V_{GS} = 0 V, T_J = 125℃)					1.0	
Gate-Source Leakage Current-Forward (V_{gsf} = 20 V, V_{DS} = 0 V)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse (V_{gsr} = 20 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 = 10A) *		$R_{DS(on)}$			0.18	Ω
Drain-Source On-Voltage (V_{GS} = 10 V) (I_D = 5.0 A)		$V_{DS(on)}$			6.0	V
Forward Transconductance (V_{DS} = 50 V, I_D = 10 A) *		g_{FS}	6.8			mhos
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz)	C_{iss}			1600	pF
Output Capacitance		C_{oss}			750	pF
Reverse Transfer Capacitance		C_{rss}			300	pF
Turn-On Delay Time	(V_{DD} = 30 V, I_D = 10 A, V_{GS} = 10 V, R_G = 4.7Ω) *	$t_{d(on)}$			30	ns
Rise Time		t_r			60	ns
Turn-Off Delay Time		$t_{d(off)}$			80	ns
Fall Time		t_f			60	ns
Total Gate Charge	(V_{DS} = 0.8Rated V_{DSS}, I_D = Rated I_D, V_{GS} = 10 V)*	Q_g		36	63	nC
Gate-Source Charge		Q_{gs}		16		nC
Gate-Drain Charge		Q_{gd}		26		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 = Rated I_D, d_{IS}/d_t = 100A/μs)	V_{SD}			1.5	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		450		ns

* Pulse Test: Pulse Width ≦300μs, Duty Cycle ≦2%

** Negligible, Dominated by circuit inductance

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