

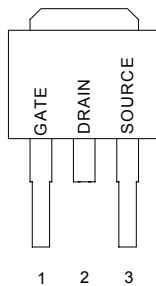
APPLICATION

- ◆ Buck Converter High Side Switch
- ◆ Other Applications

V_{DS}	$R_{DS(ON)}$ Typ.	I_D
30V	6.6m Ω	71A

PIN CONFIGURATION

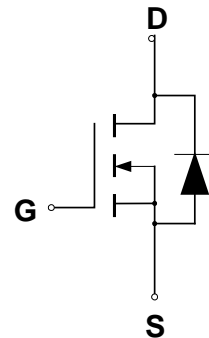
TO-252
Front View



FEATURES

- ◆ Low ON Resistance
- ◆ Low Gate Charge
- ◆ Peak Current vs Pulse Width Curve
- ◆ Inductive Switching Curves
- ◆ Improved UIS Ruggedness

SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Source Voltage (Note 1)	V_{DS}	30	V
Drain to Current — Continuous $T_c = 25^\circ\text{C}$, $V_{GS}@10\text{V}$ (Note 2)	I_D	71	A
— Continuous $T_c = 100^\circ\text{C}$, $V_{GS}@10\text{V}$ (Note 2)	I_D	45	
— Pulsed $T_c = 25^\circ\text{C}$, $V_{GS}@10\text{V}$ (Note 3)	I_{DM}	284	
Gate-to-Source Voltage — Continue	V_{GS}	± 20	V
Total Power Dissipation	P_D	66	W
Derating Factor above 25°C		0.53	W/ $^\circ\text{C}$
Peak Diode Recovery dv/dt (Note 4)	dv/dt	3.0	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Single Pulse Avalanche Energy	E_{AS}	TBD	mJ
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^\circ\text{C}$
Maximum Package Body for 10 seconds	T_{PKG}	260	$^\circ\text{C}$

THERMAL RESISTANCE

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
$R_{\theta JC}$	Junction-to-case			1.9	$^\circ\text{C}/\text{W}$	Water cooled heatsink, P_D adjusted for a peak junction temperature of $+150^\circ\text{C}$
$R_{\theta JA}$	Junction-to-ambient (PCB Mount)			50	$^\circ\text{C}/\text{W}$	Minimum pad area, 2-oz copper, FR-4 circuit board, double sided
$R_{\theta JA}$	Junction-to-ambient			62	$^\circ\text{C}/\text{W}$	1 cubic foot chamber, free air

ORDERING INFORMATION

Part Number	Package
CMT70N03	TO-252

ELECTRICAL CHARACTERISTICS

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

		CMT70N03			
Characteristic	Symbol	Min	Typ	Max	Units
OFF Characteristics					
Drain-to-Source Breakdown Voltage (V _{GS} = 0 V, I _D = 250 μA)	V _{DSS}	30			V
Breakdown Voltage Temperature Coefficient, (Reference to 25°C, I _D = 1mA)	ΔV _{DSS} /ΔT _J		0.05		V/°C
Drain-to-Source Leakage Current (V _{DS} = 30 V, V _{GS} = 0 V, T _J = 25°C) (V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125°C)	I _{DSS}			1 10	μA
Gate-to-Source Forward Leakage (V _{GS} = 20 V)	I _{GSS}			100	nA
Gate-to-Source Reverse Leakage (V _{GS} = -20 V)	I _{GSS}			-100	nA
ON Characteristics					
Gate Threshold Voltage, (V _{DS} = V _{GS} , I _D = 250 μA)	V _{GS(th)}	1.0		3.0	V
Static Drain-to-Source On-Resistance, (Note 5) (V _{GS} = 10 V, I _D = 15A) (V _{GS} = 4.5 V, I _D = 12A)	R _{DS(on)}		6.6 12	8.0	mΩ
Forward Transconductance (V _{DS} = 20V, I _D = 12A) (Note 5)	g _{FS}		30		S
Dynamic Characteristics					
Input Capacitance	(V _{DS} = 15 V, V _{GS} = 0 V, f = 1.0 MHz)	C _{iss}	2600		pF
Output Capacitance		C _{oss}	480		pF
Reverse Transfer Capacitance		C _{rss}	230		pF
Total Gate Charge (V _{GS} = 10 V)	(V _{DS} = 15 V, I _D = 12 A) (Note5, 6)	Q _g	50		nC
Total Gate Charge (V _{GS} = 4.5 V)		Q _g	25		nC
Gate-to-Source Charge		Q _{gs}	7.5		nC
Gate-to-Drain Charge		Q _{gd}	8.5		nC
Resistive Switching Characteristics					
Turn-On Delay Time	(V _{DD} = 15 V, I _D = 15 A, V _{GS} = 10 V, R _G = TBDΩ) (Note 5,6)	t _{d(on)}	TBD		ns
Rise Time		t _r	TBD		ns
Turn-Off Delay Time		t _{d(off)}	TBD		ns
Fall Time		t _f	TBD		ns
Source-Drain Diode Characteristics					
Continuous Source Current (Body Diode)	Integral pn-diode in MOSFET(Note 2)	I _S		71	A
Pulse Source Current (Body Diode)		I _{SM}		284	A
Forward On-Voltage	(I _S = 12 A, V _{GS} = 0 V)	V _{SD}		1.0	V
Forward Turn-On Time	(I _F = 12 A, V _{GS} = 0 V, d _i /d _t = 100A/μs) (Note 5)	t _{rr}	30		ns
Reverse Recovery Charge		Q _{rr}	40		nC

Note 1: $T_J = +25^{\circ}\text{C}$ to 150°C

Note 2: Current is calculated based upon maximum allowable junction temperature.

Package current limitation is 30A.

Note 3: Repetitive rating; pulse width limited by maximum junction temperature.

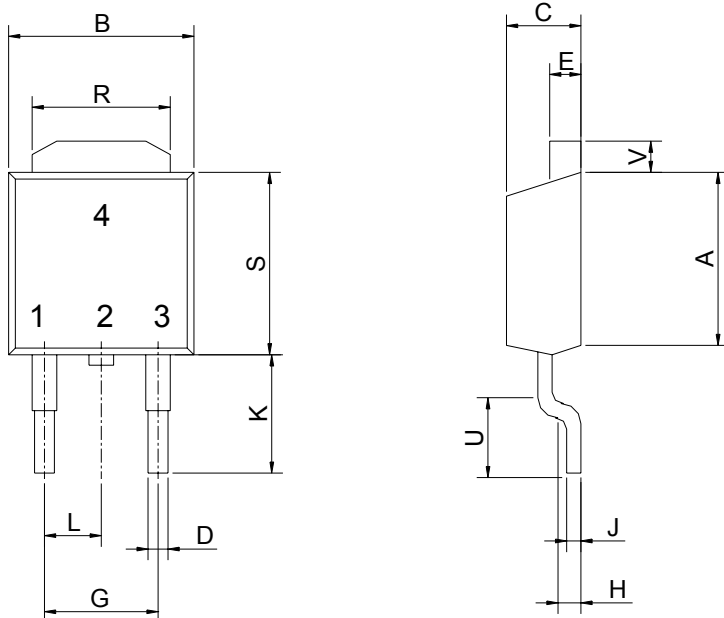
Note 4: $I_{SD} = 12.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, $T_J = +150^{\circ}\text{C}$

Note 5: Pulse width $\leq 250\mu\text{s}$; duty cycle $\leq 2\%$

Note 6: Essentially independent of operating temperature.

PACKAGE DIMENSION

TO-252



PIN 1: GATE
PIN 2: DRAIN
PIN 3: SOURCE

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	5.97	---	6.35	0.235	---	0.250
B	6.35	---	6.73	0.250	---	0.265
C	2.19	---	2.38	0.086	---	0.094
D	0.69	---	0.88	0.027	---	0.035
E	0.84	---	1.01	0.033	---	0.047
G	4.58BSC			0.180BSC		
H	0.87	---	1.01	0.034	---	0.040
J	0.46	---	0.58	0.018	---	0.023
K	2.60	---	2.89	0.102	---	0.114
L	2.29BSC			0.090BSC		
R	4.45	---	5.46	0.175	---	0.215
S	0.51	---	1.27	0.020	---	0.050
U	0.51	---	---	0.020	---	---
V	0.77	---	1.27	0.030	---	0.050

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