

**APPLICATION**

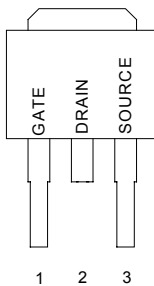
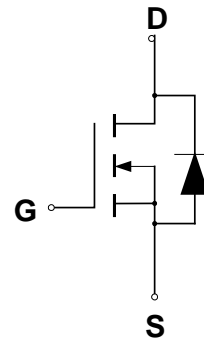
- ◆ Buck Converter High Side Switch
- ◆ Other Applications

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

**FEATURES**

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

**PIN CONFIGURATION**

 TO-252  
Front View

**SYMBOL**


N-Channel MOSFET

**ABSOLUTE MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Drain to Source Voltage (Note 1)	$V_{DSS}$	30	V
Drain to Current – Continuous $T_c = 25^\circ\text{C}$ , $V_{GS}@10\text{V}$ (Note 2)	$I_D$	71	A
	$I_D$	45	
	$I_{DM}$	284	
Gate-to-Source Voltage – Continue	$V_{GS}$	$\pm 20$	V
Total Power Dissipation Derating Factor above $25^\circ\text{C}$	$P_D$	66	W
		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,  $T_J = 25^\circ\text{C}$ .

Characteristic	Symbol	CMT70N03			Units
		Min	Typ	Max	
<b>OFF Characteristics</b>					
Drain-to-Source Breakdown Voltage ( $V_{GS} = 0\text{ V}$ , $I_D = 250\ \mu\text{A}$ )	$V_{DSS}$	30			V
Breakdown Voltage Temperature Coefficient, (Reference to $25^\circ\text{C}$ , $I_D = 1\text{mA}$ )	$\Delta V_{DSS}/\Delta T_J$		0.05		$^\circ\text{C}$
Drain-to-Source Leakage Current ( $V_{DS} = 30\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 25^\circ\text{C}$ ) ( $V_{DS} = 24\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 125^\circ\text{C}$ )	$I_{DSS}$			1 10	$\mu\text{A}$
Gate-to-Source Forward Leakage ( $V_{GS} = 20\text{ V}$ )	$I_{GSS}$			100	nA
Gate-to-Source Reverse Leakage ( $V_{GS} = -20\text{ V}$ )	$I_{GSS}$			-100	nA
<b>ON Characteristics</b>					
Gate Threshold Voltage, ( $V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$ )	$V_{GS(th)}$	1.0		3.0	V
Static Drain-to-Source On-Resistance, (Note 5) ( $V_{GS} = 10\text{ V}$ , $I_D = 15\text{A}$ ) ( $V_{GS} = 4.5\text{ V}$ , $I_D = 12\text{A}$ )	$R_{DS(on)}$		6.6 12	8.0	m $\Omega$
Forward Transconductance ( $V_{DS} = 20\text{V}$ , $I_D = 12\text{A}$ ) (Note 5)	$g_{FS}$		30		S
<b>Dynamic Characteristics</b>					
Input Capacitance	( $V_{DS} = 15\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{iss}$	2600		pF
Output Capacitance		$C_{oss}$	480		pF
Reverse Transfer Capacitance		$C_{rss}$	230		pF
Total Gate Charge ( $V_{GS} = 10\text{ V}$ )	( $V_{DS} = 15\text{ V}$ , $I_D = 12\text{ A}$ ) (Note5, 6)	$Q_g$	50		nC
Total Gate Charge ( $V_{GS} = 4.5\text{ V}$ )		$Q_g$	25		nC
Gate-to-Source Charge		$Q_{gs}$	7.5		nC
Gate-to-Drain Charge		$Q_{gd}$	8.5		nC
<b>Resistive Switching Characteristics</b>					
Turn-On Delay Time	( $V_{DD} = 15\text{ V}$ , $I_D = 15\text{ A}$ , $V_{GS} = 10\text{ V}$ , $R_G = \text{TBD}\Omega$ ) (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
<b>Source-Drain Diode Characteristics</b>					
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 ( $I_S = 12\text{ A}$ , $V_{GS} = 0\text{ V}$ )		$V_{SD}$		1.0	V
Forward Turn-On Time ( $I_F = 12\text{ A}$ , $V_{GS} = 0\text{ V}$ ,		$t_{rr}$	30		ns
Reverse Recovery Charge $d/d_t = 100\text{A}/\mu\text{s}$ ) (Note 5)		$Q_{rr}$	40		nC

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

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

Package current limitation is 30A.

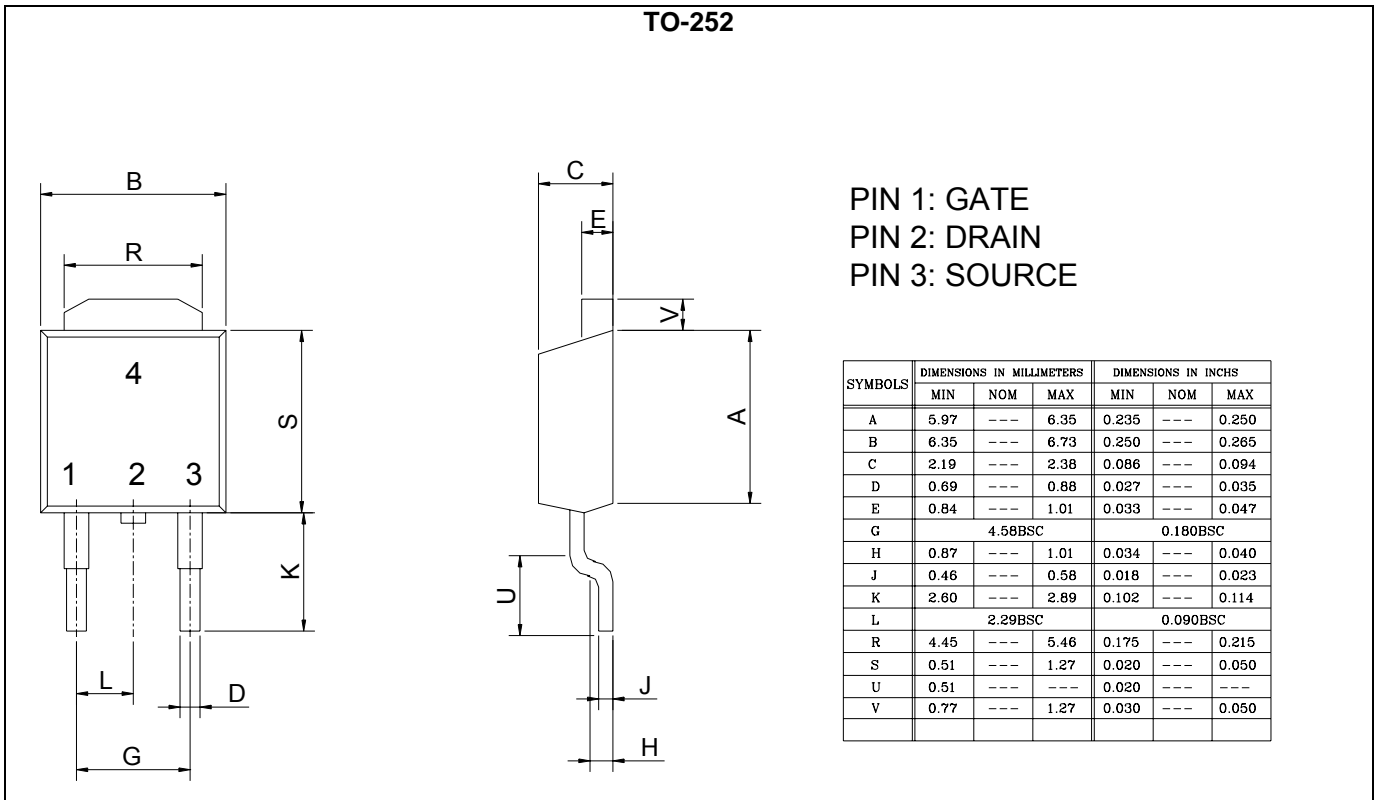
Note 3: Repetitive rating; pulse width limited by maximum junction temperature.

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



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