

**APPLICATION**

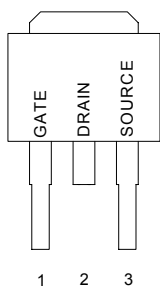
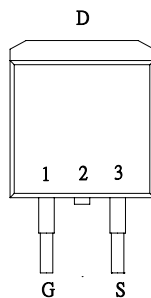
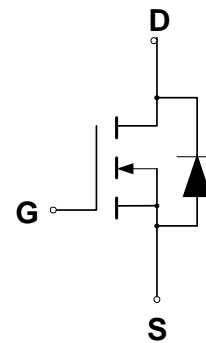
- ◆ Buck Converter High Side Switch
- ◆ Other Applications

$V_{DSS}$	$R_{DS(ON)}$ Typ.	$I_D$
30V	10.8m $\Omega$	50A

**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

 TO-263  
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)	$I_D$	50	A
	$I_D$	Fig.3	
	$I_{DM}$	Fig.6	
Gate-to-Source Voltage — Continue	$V_{GS}$	$\pm 20$	V
Total Power Dissipation Derating Factor above $25^\circ\text{C}$	$P_D$	52	W
		0.5	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 $L=1.1\text{mH}, I_D=30\text{Amps}$	$E_{AS}$	500	mJ
Maximum Lead Temperature for Soldering Purposes	$T_L$	300	$^\circ\text{C}$
Maximum Package Body for 10 seconds	$T_{PKG}$	260	$^\circ\text{C}$
Pulsed Avalanche Rating	$I_{AS}$	Fig.8	

**THERMAL RESISTANCE**

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
$R_{\theta JC}$	Junction-to-case			2.4	$^\circ\text{C}/\text{W}$	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
CMT60N03GN252	TO-252
CMT60N03GN263	TO-263

**ELECTRICAL CHARACTERISTICS**

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

Characteristic	Symbol	CMT60N03G			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, Fig.11 (Reference to $25^\circ\text{C}$ , $I_D = 250\ \mu\text{A}$ )	$\Delta V_{DSS}/\Delta T_J$		27		$\text{mV}/^\circ\text{C}$
Drain-to-Source Leakage Current ( $V_{DS} = 24\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 25^\circ\text{C}$ ) ( $V_{DS} = 24\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 125^\circ\text{C}$ )	$I_{DSS}$			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, Fig.12 ( $V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$ )	$V_{GS(th)}$	1.0		3.0	V
Static Drain-to-Source On-Resistance, Fig.9,10 (Note 5) ( $V_{GS} = 10\text{ V}$ , $I_D = 15\text{A}$ ) ( $V_{GS} = 4.5\text{ V}$ , $I_D = 12\text{A}$ )	$R_{DS(on)}$		10.8 15.4	12.5	$\text{m}\Omega$
Forward Transconductance ( $V_{DS} = 15\text{ V}$ , $I_D = 12\text{A}$ ) (Note 5)	$g_{FS}$		28		S
<b>Dynamic Characteristics</b>					
Input Capacitance	$(V_{DS} = 15\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1.0\text{ MHz}$ ) Fig.14	$C_{iss}$	1520		$\mu\text{F}$
Output Capacitance		$C_{oss}$	314		$\mu\text{F}$
Reverse Transfer Capacitance		$C_{rss}$	152		$\mu\text{F}$
Total Gate Charge ( $V_{GS} = 10\text{ V}$ )	$(V_{DS} = 15\text{ V}$ , $I_D = 12\text{A}$ ) (Note 6) Fig.15	$Q_g$	27.9	35	nC
Total Gate Charge ( $V_{GS} = 4.5\text{ V}$ )		$Q_g$	14	19	nC
Gate-to-Source Charge		$Q_{gs}$	4.9		nC
Gate-to-Drain Charge		$Q_{gd}$	4.3		nC
<b>Resistive Switching Characteristics</b>					
Turn-On Delay Time	$(V_{DD} = 15\text{ V}$ , $I_D = 12\text{ A}$ , $V_{GS} = 10\text{ V}$ , $R_G = 1.0\Omega$ ) (Note 6)	$t_{d(on)}$	10		ns
Rise Time		$t_r$	3.4		ns
Turn-Off Delay Time		$t_{d(off)}$	36		ns
Fall Time		$t_f$	6.0		ns
Turn-On Delay Time	$(V_{DD} = 15\text{ V}$ , $I_D = 12\text{ A}$ , $V_{GS} = 4.5\text{ V}$ , $R_G = 1.0\Omega$ ) (Note 6)	$t_{d(on)}$	16		ns
Rise Time		$t_r$	7.2		ns
Turn-Off Delay Time		$t_{d(off)}$	34		ns
Fall Time		$t_f$	14		ns
<b>Source-Drain Diode Characteristics</b>					
Continuous Source Current (Body Diode Fig.16)	Integral pn-diode in MOSFET	$I_S$		50	A
Pulse Source Current (Body Diode)		$I_{SM}$		Fig.6	A
Forward On-Voltage ( $I_S = 12\text{ A}$ , $V_{GS} = 0\text{ V}$ )		$V_{SD}$		1.0	V
Forward Turn-On Time ( $I_F = 12\text{ A}$ , $V_{GS} = 0\text{ V}$ ,		$t_{rr}$	25	38	ns
Reverse Recovery Charge ( $d_f/d_t = 100\text{A}/\mu\text{s}$ )		$Q_{rr}$	31	46	nC



# CMT60N03G

## N-CHANNEL Logic Level Power MOSFET

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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.

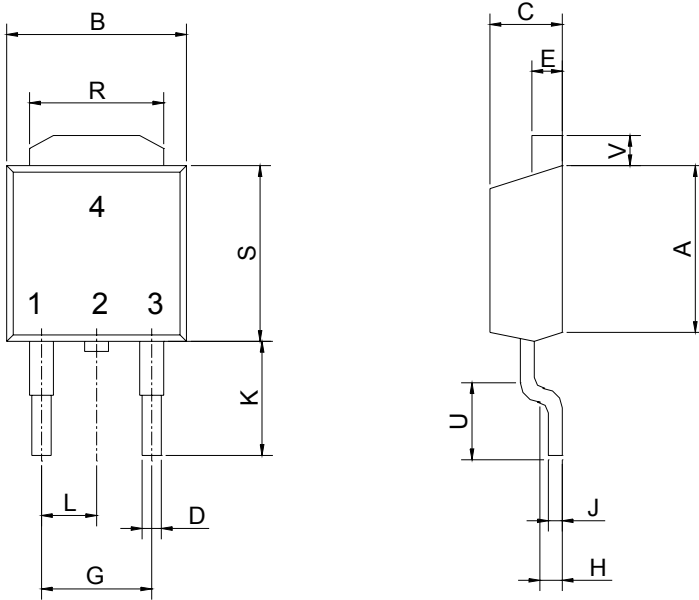
Note 4:  $I_{SD} = 12.0\text{A}$ ,  $di/dt \leq 100\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J = +150^{\circ}\text{C}$

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

Note 6: Essentially independent of operating temperature.

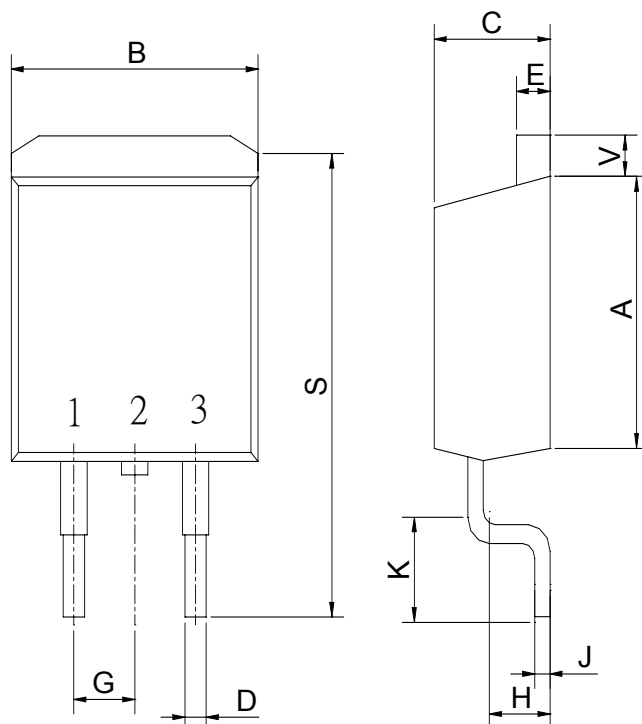
**PACKAGE DIMENSION**

TO-252


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

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	6.97	---	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

TO-263


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

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	8.64	---	9.65	0.340	---	0.380
B	9.65	---	10.29	0.380	---	0.405
C	4.06	---	4.83	0.160	---	0.190
D	0.51	---	0.89	0.020	---	0.035
E	1.14	---	1.40	0.045	---	0.055
G	2.54BSC			0.100BSC		
H	2.03	---	2.79	0.080	---	0.110
J	0.46	---	0.64	0.018	---	0.025
K	2.29	---	2.79	0.090	---	0.110
S	14.60	---	15.88	0.575	---	0.625
V	1.14	---	1.40	0.045	---	0.055

## IMPORTANT NOTICE

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