

### General Description

The 60N03 is N-channel MOSFET device that features a low on-state resistance and excellent switching characteristics, and designed for low voltage high current applications such as DC/DC converter with synchronous rectifier.

### Features

- Simple Drive Requirement
- Low Gate Charge
- Fast Switching
- Ultra-Low RDS(on)
- Green Device Available

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current <sup>1</sup>	60	A
$I_D@T_C=100^\circ C$	Continuous Drain Current <sup>1</sup>	50	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	180	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	55	mJ
$I_{AS}$	Avalanche Current	50	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	55	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	52	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction -Case <sup>1</sup>	---	2.73	$^\circ C/W$

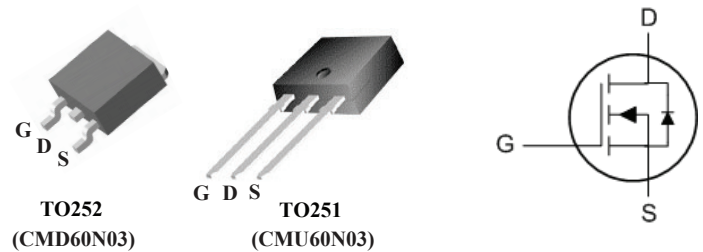
### Product Summary

BVDSS	RDSON	ID
30V	7m $\Omega$	60A

### Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- DC/DC converter
- Motor drives

### TO252 / TO251 Pin Configuration



TO252  
(CMD60N03)

TO251  
(CMU60N03)

N-Ch 30V Fast Switching MOSFETs

Electrical Characteristics ( $T_J=25\text{ }^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to $25\text{ }^\circ\text{C}$ , $I_D=250\mu A$	---	0.012	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=20A$	---	5	7	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	---	9.5	13	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1	2	3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-6	---	mV/ $^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V, T_J=25\text{ }^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=150\text{ }^\circ\text{C}$	---	---	250	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=10A$	---	45	---	S
$R_g$	Gate Resistance	$V_{GS}=0.5V, f=1\text{MHz}$	---	2.3	---	$\Omega$
$Q_g$	Total Gate Charge	$V_{DS}=15V, I_D=20A, V_{GS}=4.5V$	---	15	---	nC
$Q_{gs}$	Gate-Source Charge		---	4.4	---	
$Q_{gd}$	Gate-Drain Charge		---	7.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_{GS}=10\Omega, I_D=20A$	---	10	---	ns
$T_r$	Rise Time		---	100	---	
$T_{d(off)}$	Turn-Off Delay Time		---	45	---	
$T_f$	Fall Time		---	38	---	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1150	---	pF
$C_{oss}$	Output Capacitance		---	250	---	
$C_{rss}$	Reverse Transfer Capacitance		---	150	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1</sup>	$V_G=V_D=0V$ , Force Current	---	---	60	A
$I_{SM}$	Pulsed Source Current <sup>2</sup>		---	---	180	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=35A, T_J=25\text{ }^\circ\text{C}$	---	---	1.25	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=27V, V_{GS}=10V, L=0.14\text{mH}, I_{AS}=28A$