

## General Description

The 20N06L combines advanced trench MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance.

These devices are well suited for low voltage applications such as automotive, DC/DC converters, and high efficiency switching for power management in portable and battery operated products.

## Features

- 20A, 60V.  $R_{DS(ON)} = 0.046\Omega @ V_{GS} = 10V$
- Fast switching
- Low Threshold Drive

## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current	20	A
$I_D @ T_A = 100^\circ C$	Continuous Drain Current	10	A
$I_{DM}$	Pulsed Drain Current	80	A
EAS	Single Pulse Avalanche Energy (Note 1)	170	mJ
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	60	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 (Note 2)	---	80	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	2.5	$^\circ C/W$

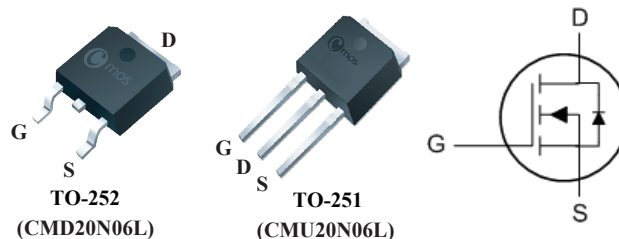
## Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
60V	46m $\Omega$	20A

## Applications

- Power Supplies
- Converters
- Power Motor Controls
- Bridge Circuits

## TO-252/251 Pin Configuration



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=250\mu A$	60	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=250\mu A$	---	0.07	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$ , $I_D=10A$ (Note 3)	---	---	46	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=250\mu A$	1	---	3	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=60V$ , $V_{GS}=0V$	---	---	1	$\mu A$
		$V_{DS}=60V$ , $V_{GS}=0V$ , $T_J=150^\circ\text{C}$	---	---	10	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V$ , $V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=5V$ , $I_D=10A$	---	13	---	S
$Q_g$	Total Gate Charge	$V_{DS}=48V$ , $V_{GS}=10V$ , $I_D=20A$ (Note 3)	---	21	---	nC
$Q_{gs}$	Gate-Source Charge		---	5.6	---	
$Q_{gd}$	Gate-Drain Charge		---	7.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V$ , $V_{GS}=10V$ , $R_G=9.1\Omega$ $I_D=20A$ (Note 3)	---	10	---	ns
$T_r$	Rise Time		---	62	---	
$T_{d(off)}$	Turn-Off Delay Time		---	27	---	
$T_f$	Fall Time		---	40	---	
$C_{iss}$	Input Capacitance	$V_{DS}=25V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	720	---	pF
$C_{oss}$	Output Capacitance		---	205	---	
$C_{rss}$	Reverse Transfer Capacitance		---	48	---	

## Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	20	A
$I_{SM}$	Pulsed Source Current		---	---	80	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V$ , $I_S=20A$ (Note 3)	---	---	1.2	V

Notes :

1.  $V_{DD} = 25V$ ,  $V_{GS} = 10V$ ,  $L = 1.0\text{mH}$ ,  $I_L(pk) = 18.4A$ ,  $V_{DS} = 60V$ , Starting  $T_J = 25^\circ\text{C}$ .
2. When surface mounted to an FR4 board using the minimum recommended pad size.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

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