

# CMH90N30SD

300V, 54mΩ typ., 90A N-Channel MOSFET

## General Description

This Power MOSFET is produced using Cmos's advanced planar stripe DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

## Features

- Ultra-fast body diode
- 100% avalanche tested
- RoHS Compliant

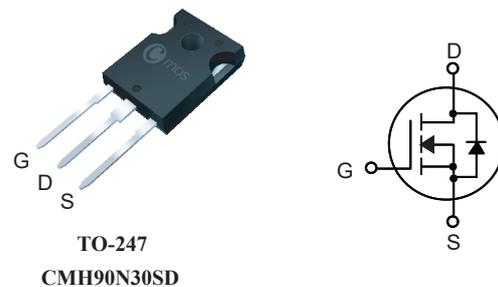
## Product Summary

BVDSS	R <sub>DS(on)</sub> max.	ID
300V	60mΩ	90A

## Applications

- High Speed Power Switching
- Uninterruptible Power Supply
- High Efficiency Synchronous Rectification in SMPS

## TO-247 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	300	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current	90	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current	54	A
I <sub>DM</sub>	Pulsed Drain Current	360	A
EAS	Single Pulse Avalanche Energy (Note 1)	3610	mJ
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	500	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	150	°C

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient	---	62.5	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-case	---	0.25	°C/W

**Electrical Characteristics (T<sub>J</sub>=25°C , unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	300	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =45A	---	54	60	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	---	4.0	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =300V , V <sub>GS</sub> =0V	---	---	25	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V , I <sub>D</sub> =20A	---	42	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V , V <sub>GS</sub> =0V , f=1MHz	---	1.0	---	Ω
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =82A	---	153	---	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =240V	---	37	---	
Q <sub>gd</sub>	Gate-Drain Charge	V <sub>GS</sub> =10V (Note 2,3)	---	55	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =150V I <sub>D</sub> =82A R <sub>G</sub> =25Ω (Note 2,3)	---	83	---	ns
T <sub>r</sub>	Rise Time		---	44	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	361	---	
T <sub>f</sub>	Fall Time		---	57	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V , V <sub>GS</sub> =0V , f=1MHz	---	7700	---	pF
C <sub>oss</sub>	Output Capacitance		---	720	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	50	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	90	A
I <sub>SM</sub>	Pulsed Source Current		---	---	360	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =45A , T <sub>J</sub> =25°C	---	0.88	1.5	V
t <sub>rr</sub>	Reverse Recovery Time	di/dt = 100A/μs	---	100	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	V <sub>GS</sub> =0V , I <sub>S</sub> =82A (Note 2,3)	---	2.15	---	μC

Note :

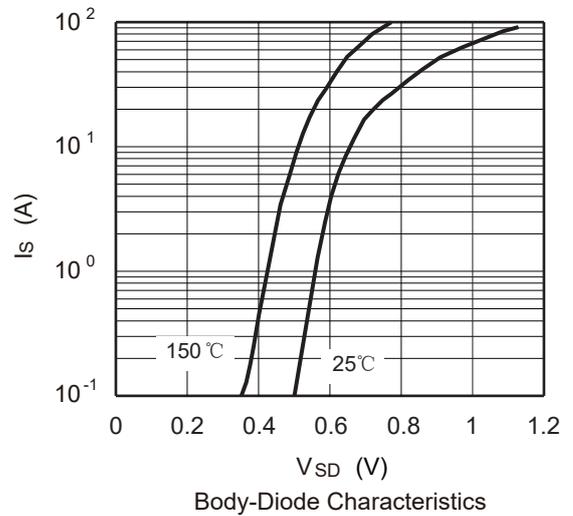
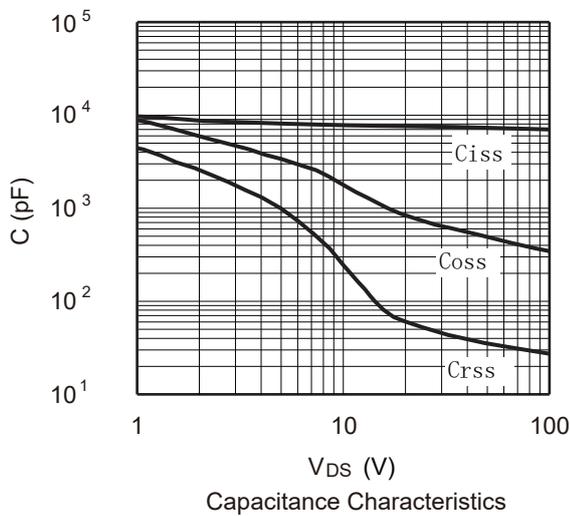
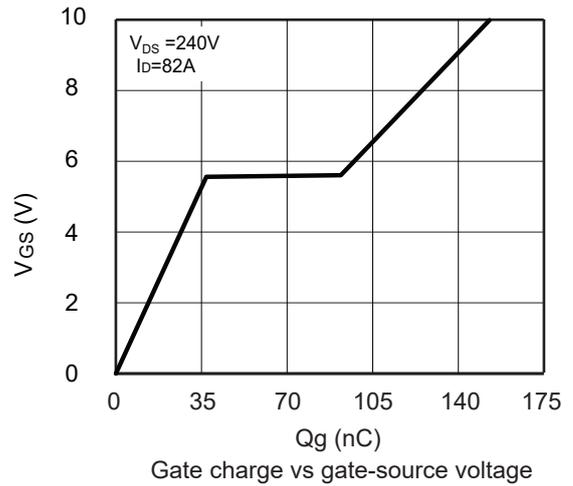
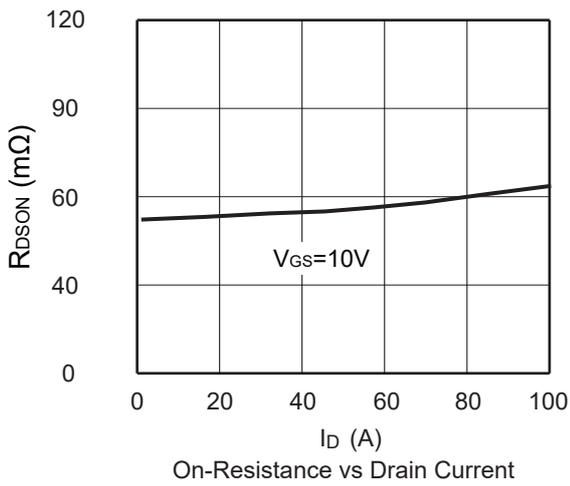
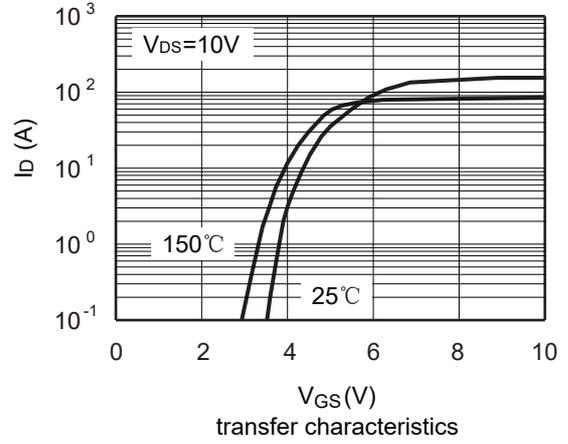
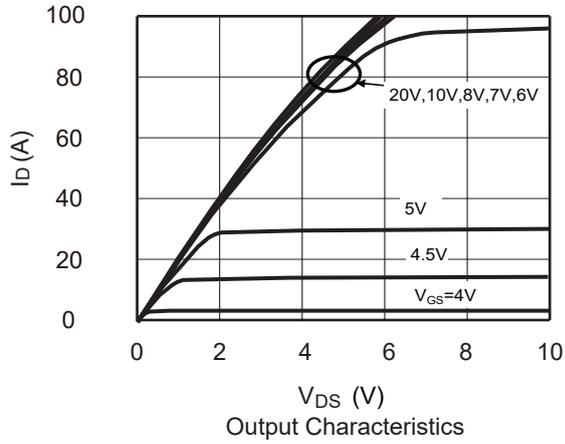
1. The EAS data shows Max. rating .The test condition is V<sub>DS</sub>=80V , V<sub>GS</sub>=10V , L=5mH , I<sub>AS</sub>=38A.
2. Pulse test: Pulse width≤300us, Duty cycle≤2%.
3. Essentially independent of operating temperature typical characteristics.

This product has been designed and qualified for the consumer market.

Cmos assumes no liability for customers' product design or applications.

Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

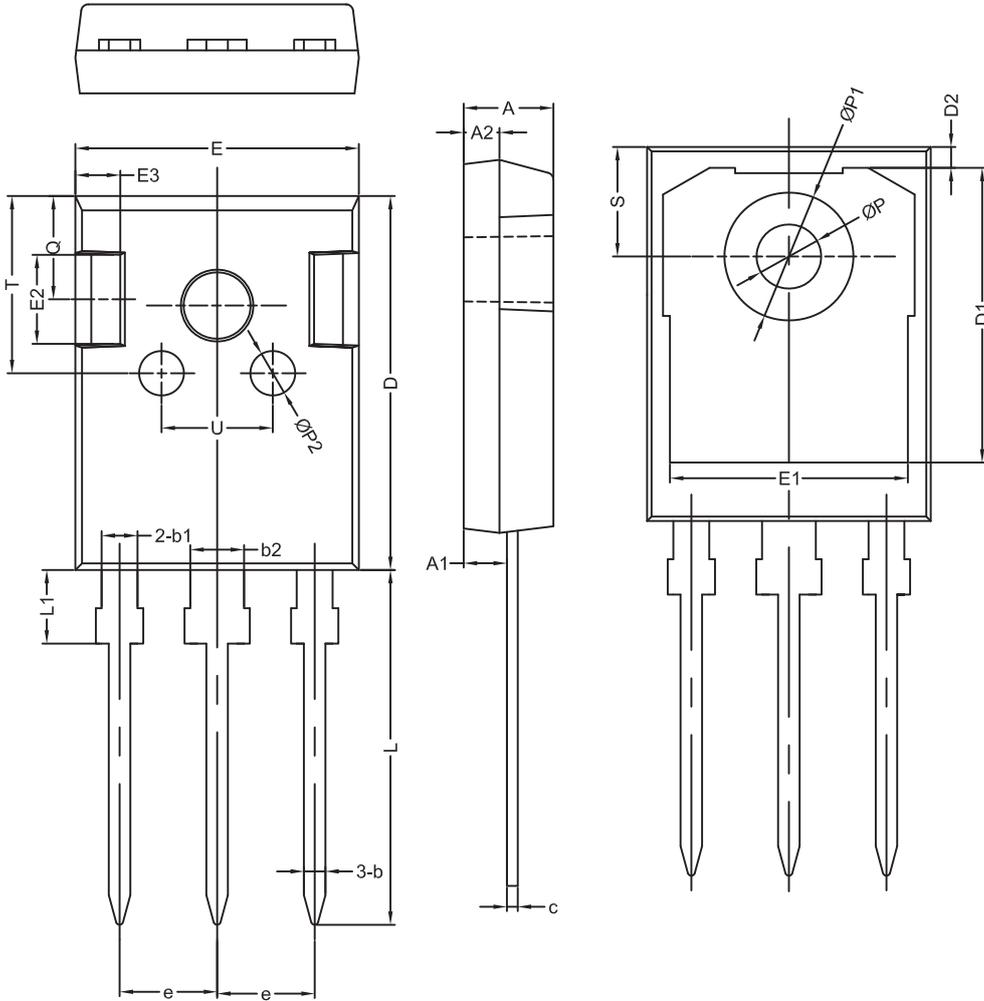
### Typical Characteristics



Package Dimension

TO-247

Unit :mm



符号	机械尺寸/mm			符号	机械尺寸/mm		
	最小值	典型值	最大值		最小值	典型值	最大值
A	4.80	5.00	5.20	E2		5.00	
A1	2.21	2.41	2.61	E3		2.50	
A2	1.90	2.00	2.10	e		5.44	
b	1.10	1.20	1.35	L	19.42	19.92	20.42
b1		2.00		L1		4.13	
b2		3.00		P	3.50	3.60	3.70
c	0.55	0.60	0.75	P1		7.19	
D	20.80	21.00	21.20	P2		2.50	
D1		16.55		Q		5.80	
D2		1.20		S	6.05	6.15	6.25
E	15.60	15.80	16.0	T		10.00	
E1		13.30		U		6.20	