

### General Description

The CMH90N30 uses advanced planar stripe DMOS technology and design

to provide excellent RDS(ON) .

These devices are well suited for high efficient switched mode power supplies and active power factor correction.

### Features

- Low on-resistance
- Fast Switching
- RoHS Compliant

### Product Summary

BVDSS	RDSON	ID
300V	46mΩ	90A

### Applications

- DC-AC converters
- SMPS Power
- UPS (Uninterruptible Power Supply)

### TO-247 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	300	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	90	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	66	A
$I_{DM}$	Pulsed Drain Current	360	A
EAS	Single Pulse Avalanche Energy <sup>1</sup>	2995	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	610	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	40	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.29	°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> =40A	---	41.5	46	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	3	3.9	5	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =250V , V <sub>GS</sub> =0V	---	---	10	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> =25A	---	42	---	S
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =82A	---	125	---	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =250V	---	45	---	
Q <sub>gd</sub>	Gate-Drain Charge	V <sub>GS</sub> =10V	---	50	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =125 V	---	80	---	ns
T <sub>r</sub>	Rise Time	I <sub>D</sub> =82A	---	26	---	
T <sub>d(off)</sub>	Turn-Off Delay Time	R <sub>G</sub> =25Ω	---	295	---	
T <sub>f</sub>	Fall Time	V <sub>GS</sub> =15V	---	80	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V , V <sub>GS</sub> =0V , f=1MHz	---	7300	---	pF
C <sub>oss</sub>	Output Capacitance		---	800	---	
C <sub>riss</sub>	Reverse Transfer Capacitance		---	70	---	

**Diode Characteristics**

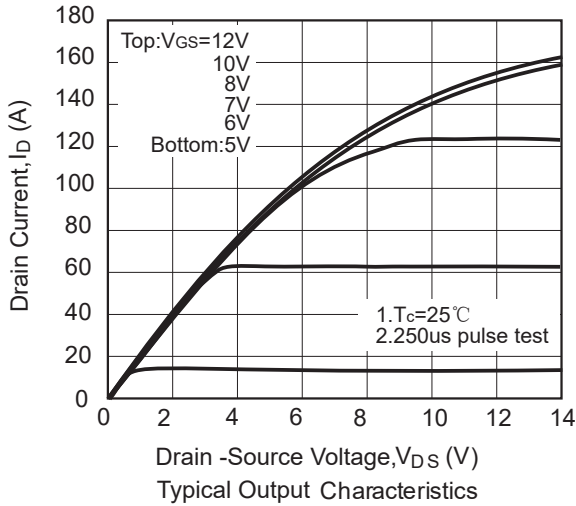
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	90	A
I <sub>SM</sub>	Pulsed Source Current		---	---	360	A
t <sub>rr</sub>	Reverse recovery time	I <sub>S</sub> =82A, V <sub>GS</sub> =0V	---	416	---	ns
Q <sub>rr</sub>	Reverse recovery charge	dI <sub>F</sub> /dt=-100A/us	---	5.2	---	uC
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =25A , T <sub>J</sub> =25°C	---	0.81	1.5	V

Note :

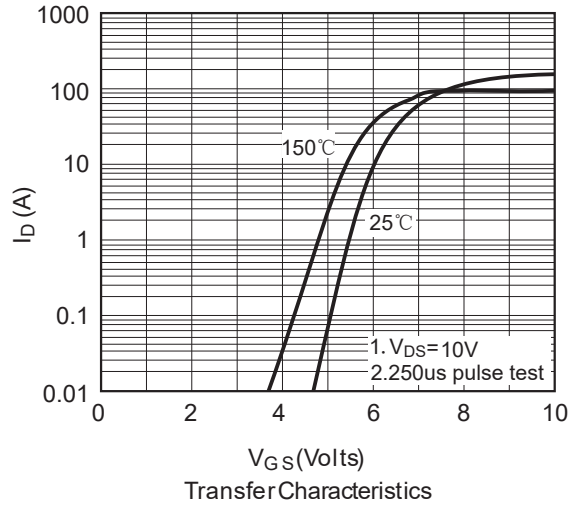
1.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=50V,V<sub>GS</sub>=10V,L=1mH,I<sub>AS</sub>=77.4A.

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.

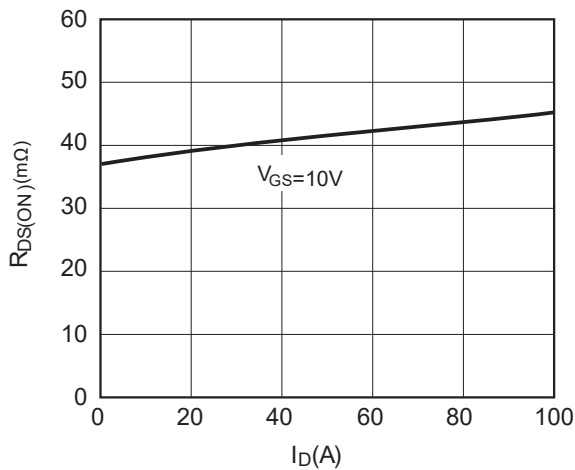
Typical Characteristics



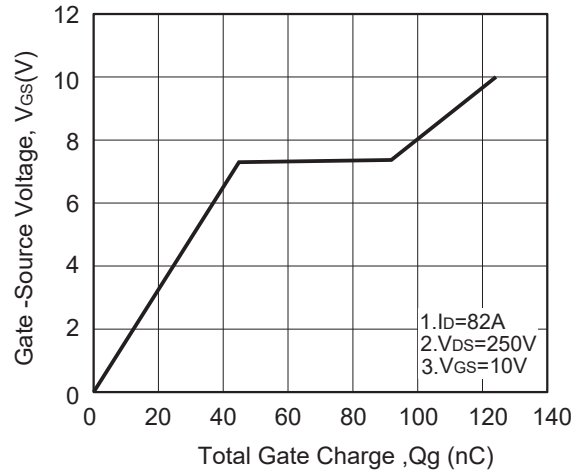
Typical Output Characteristics



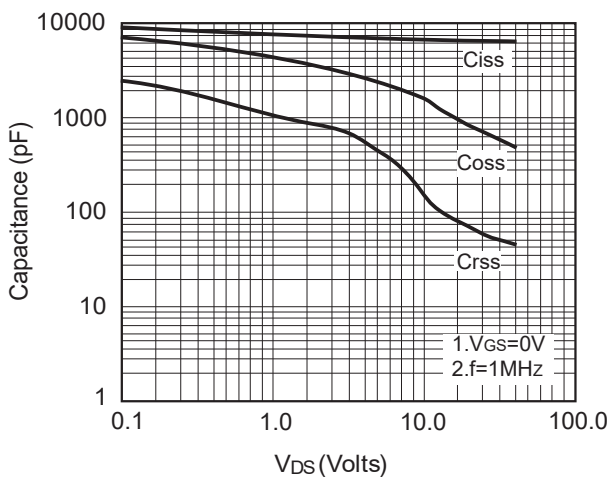
Transfer Characteristics



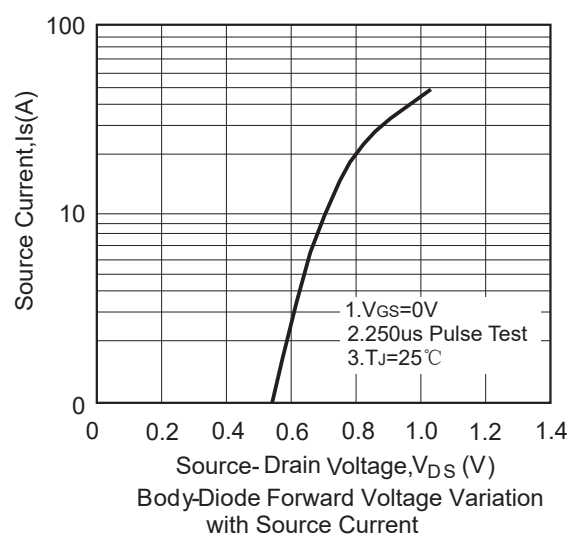
On-Resistance vs. Drain Current and Gate Voltage



Typical Total gate Charge Characteristics



Capacitance Characteristics



Body-Diode Forward Voltage Variation with Source Current

Typical Characteristics

