

General Description

The CMP50N06 is extremely high-density N-channel MOSFET, which provides the best R_{DS(ON)} and gate charge for the synchronous buck converter applications.

Features

- 50A,60V.RDS(ON)=0.018Ω @VGS=10V
- Fast Switching
- N-channel-Enhancement mode
- Low Threshold Drive
- 100% Avalanche Tested

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current ¹	50	A
I _D @T _C =100°C	Continuous Drain Current ¹	30	A
I _{DM}	Pulsed Drain Current ²	150	A
EAS	Single Pulse Avalanche Energy ³	160	mJ
I _{AS}	Avalanche Current	30	A
P _D @T _C =25°C	Total Power Dissipation	90	W
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ¹	---	65	°C/W
R _{θJC}	Thermal Resistance Junction-case	---	1.4	°C/W

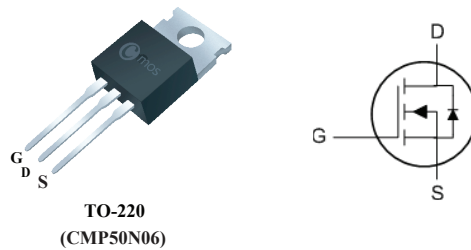
Product Summary

BVDSS	R _{DS(ON)}	I _D
60V	18mΩ	50A

Applications

- Power Supplies
- DC-DC & DC-AC Converters
- Motor Control, Audio Amplifiers
- High Current, High Speed Switching
- Solenoid And Relay Drivers

TO-220 Pin Configuration



Electrical Characteristics (T_J=25°C , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	60	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V , I _D =20A	---	16	18	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	---	3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V , V _{GS} =0V	---	---	1	uA
		V _{DS} =60V , V _{GS} =0V , T _C =125°C	---	---	10	
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V , I _D =10A	---	15	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	2	---	Ω
Q _g	Total Gate Charge	I _D =50 A V _{DS} =48 V V _{GS} =5 V	---	30	44	nC
Q _{gs}	Gate-Source Charge		---	8.6	---	
Q _{gd}	Gate-Drain Charge		---	16	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =30 V I _D =22.5A R _G =6.9Ω V _{GS} =10V	---	17	---	ns
T _r	Rise Time		---	159	---	
T _{d(off)}	Turn-Off Delay Time		---	68	---	
T _f	Fall Time		---	89	---	
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , f=1MHz	---	1500	---	pF
C _{oss}	Output Capacitance		---	580	---	
C _{rss}	Reverse Transfer Capacitance		---	120	---	

Diode Characteristics

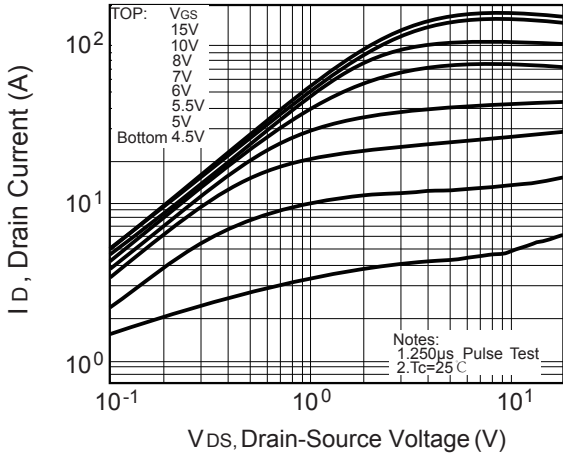
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ¹	V _G =V _D =0V , Force Current	---	---	50	A
I _{SM}	Pulsed Source Current ²		---	---	150	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =45 A , T _J =25°C	---	---	1.32	V

Note :

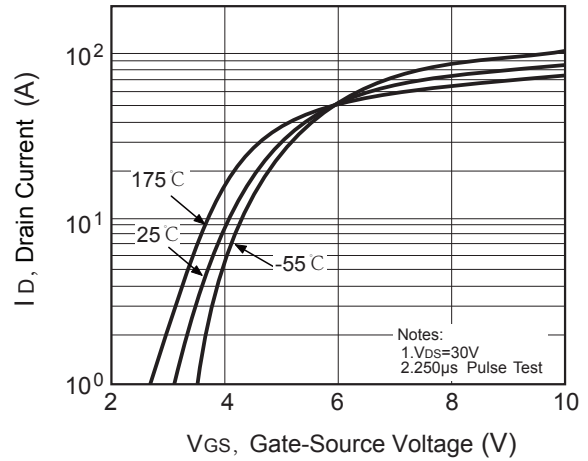
- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=30A.

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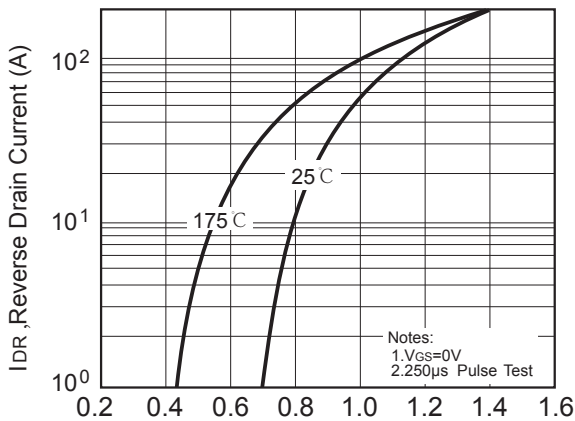
Typical Characteristics



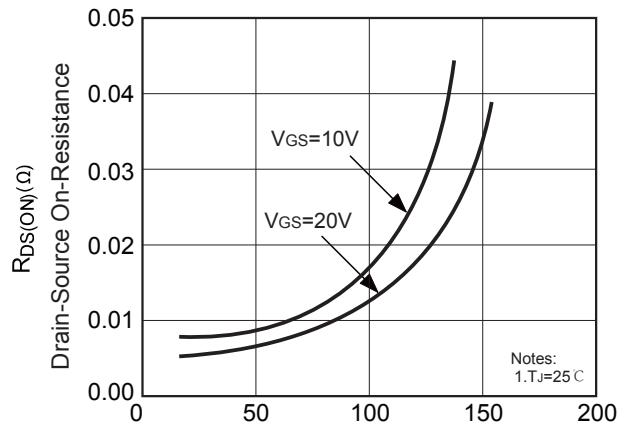
Output Characteristics



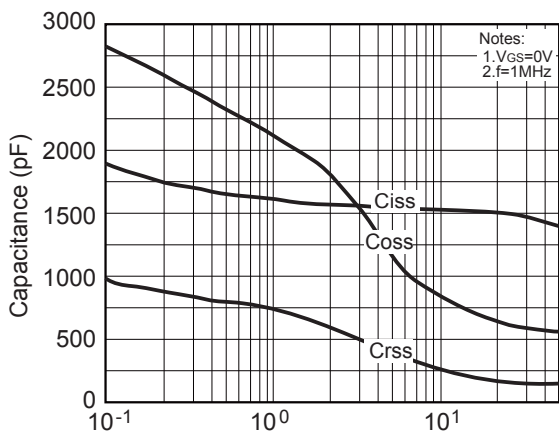
Transfer characteristics



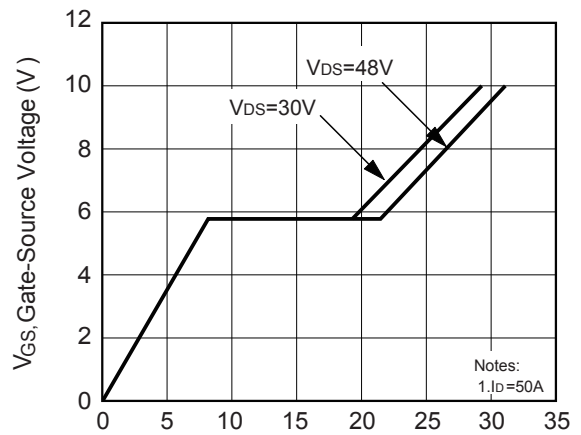
Body Diode Forward Voltage Variation vs. Source Current and Temperature



On-Resistance Variation vs. Drain Current and Gate Voltage

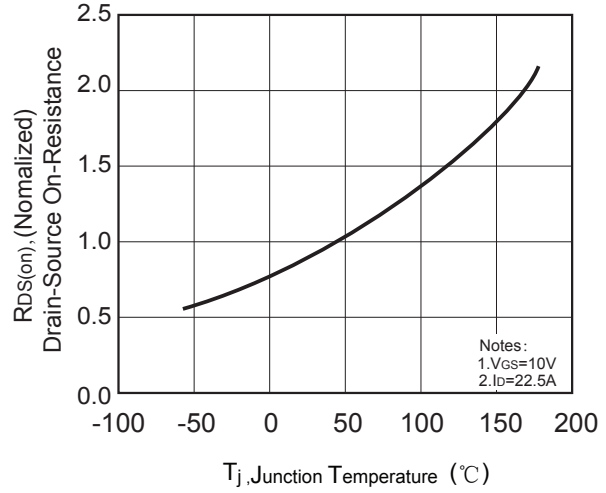
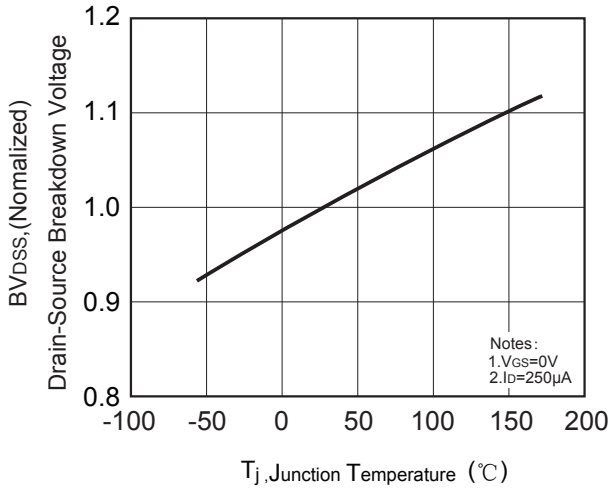


Capacitance Characteristics

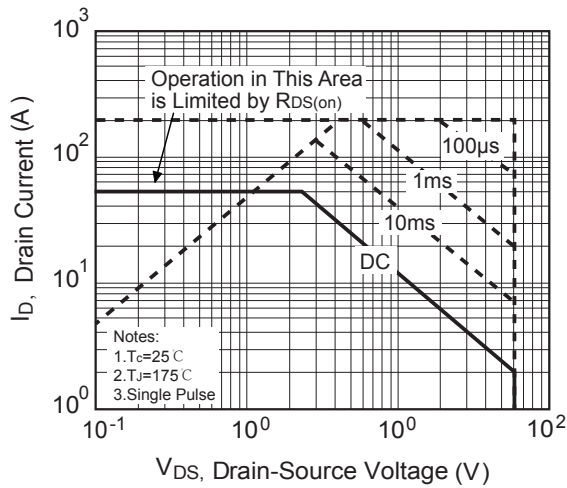


Gate Charge Characteristics

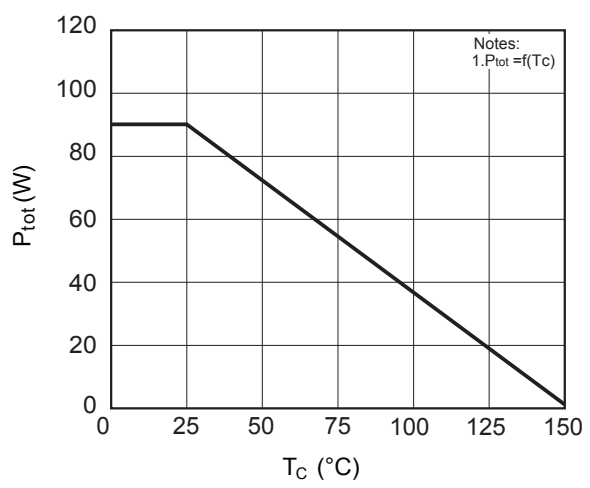
Typical Characteristics



Breakdown Voltage Variation vs. Temperature



On-Resistance Variation vs. Temperature



Maximum Safe Operating Area

Power dissipation

