CMP50N06T/CMB50N06T

60V N-Channel MOSFET

General Description

The 50N06T is extremely high-density N-channel MOSFET, which provides the best RDSON and gate charge for the synchronous buck converter applications.

Features

- 50A,60V.$R_{DS(ON)}$=0.016Ω @V_{GS}=10V
- Fast Switching
- N-channel-Enhancement mode
- Low Threshold Drive
- 100% Avalanche Tested

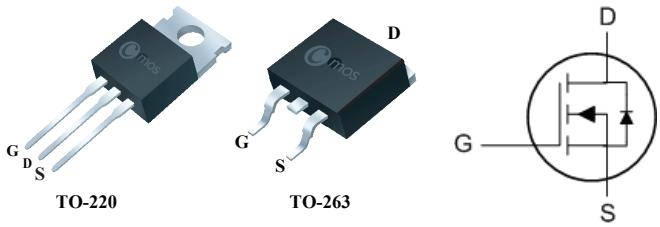
Product Summary

BVDSS	RDSON	ID
60V	16mΩ	50A

Applications

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

TO-220/263 Pin Configuration



Type	Package	Marking
CMP50N06T	TO-220	CMP50N06T
CMB50N06T	TO-263	CMB50N06T

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℃	Continuous Drain Current[1]	50	A
I_D@T_C=100℃	Continuous Drain Current[1]	30	A
I_{DM}	Pulsed Drain Current[2]	150	A
EAS	Single Pulse Avalanche Energy[3]	156	mJ
I_{AS}	Avalanche Current	25	A
P_D@T_C=25℃	Total Power Dissipation	100	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient[1]	---	65	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.4	℃/W

Electrical Characteristics (T_J=25℃ , 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	---	14	16	mΩ
		V_{GS}=4.5V , I_D=15A	---	17	20	
$V_{GS(th)}$	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℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10 V,I_D=10A	---	20	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.6	---	Ω
Q_g	Total Gate Charge	I_D=50 A V_{DS} =48 V V_{GS} =5 V	---	30	---	nC
Q_{gs}	Gate-Source Charge		---	8.5	---	
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		---	160	---	
$T_{d(off)}$	Turn-Off Delay Time		---	69	---	
T_f	Fall Time		---	70	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	2900	---	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=20 A, T_J=25℃	---	---	1.32	V

Note :
1.The data tested by surface mounted on a 1 inch^2 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}=40V,V_{GS}=10V,L=0.5mH,I_{AS}=25A.

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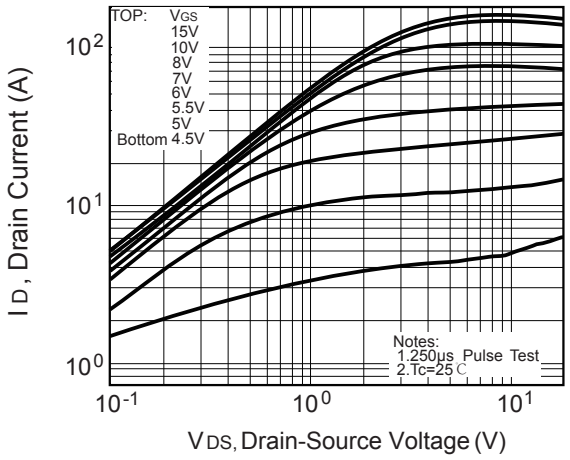
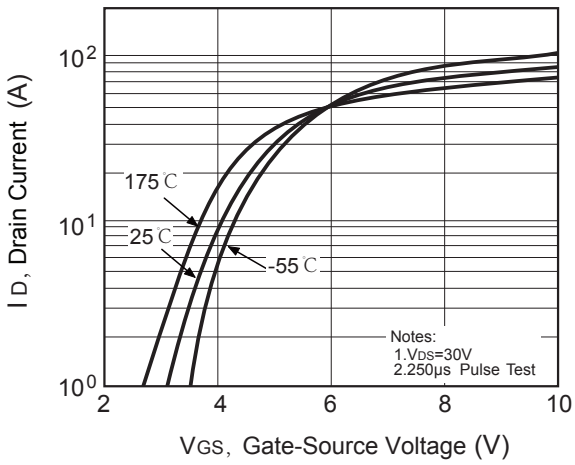
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

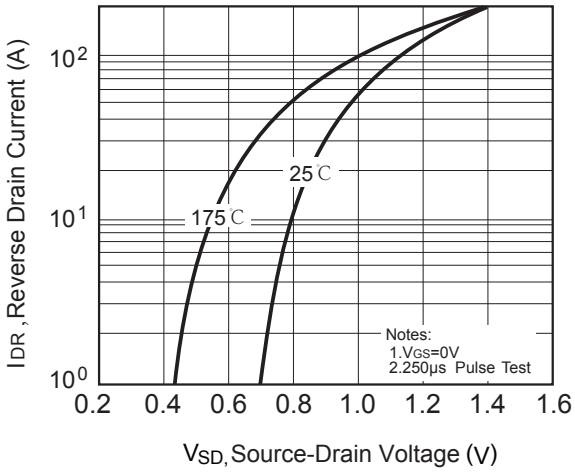
Typical Characteristics



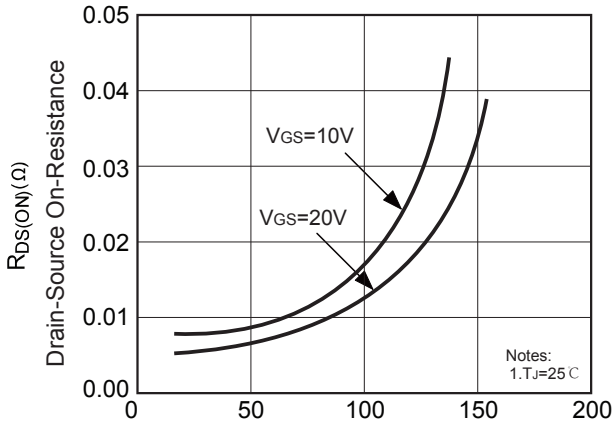
Output Characteristics



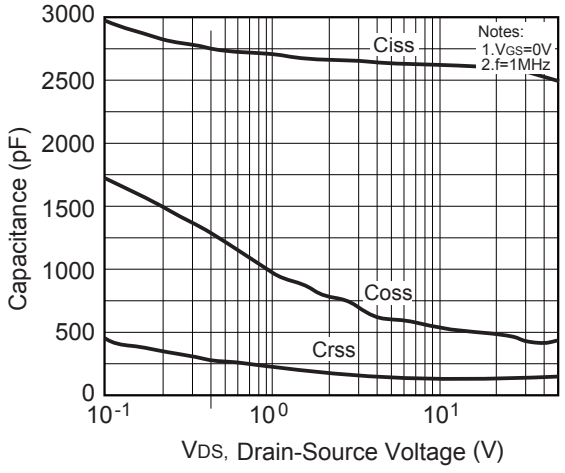
Transfer characteristics



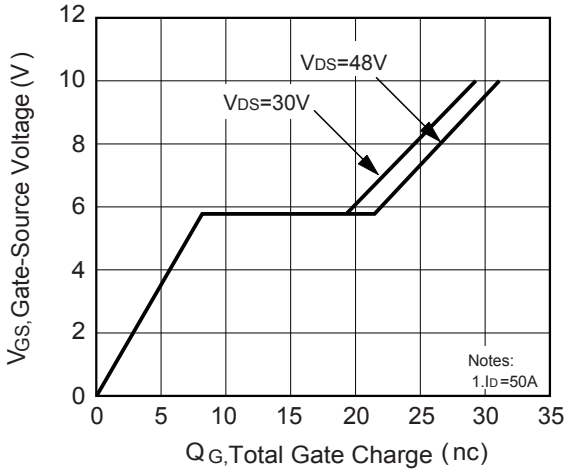
Body Diode Forward Voltage Variation vs. Source Current and Temperature



On-Resistance Variation vs. Drain Current and Gate Voltage

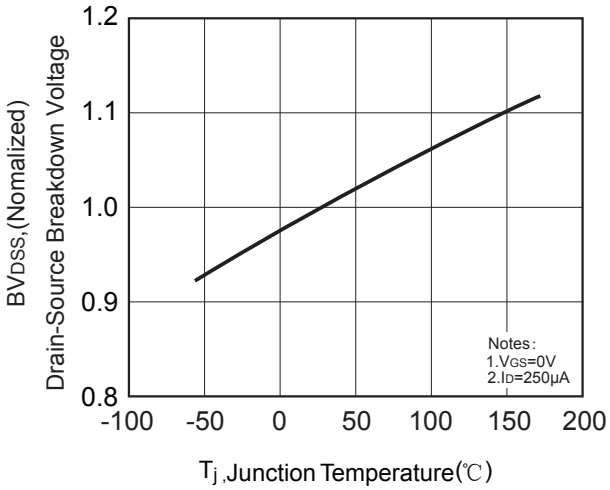


Capacitance Characteristics

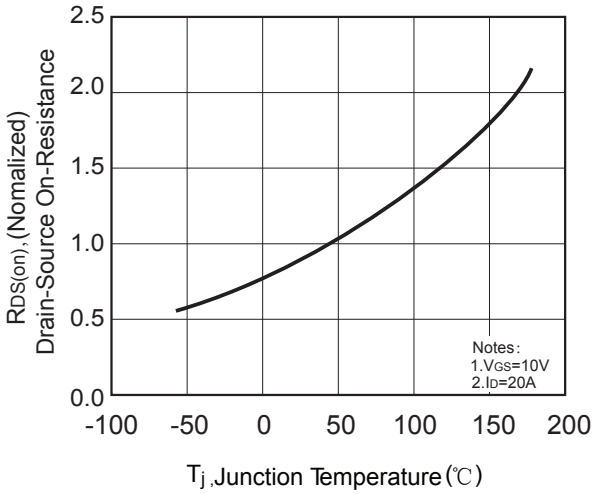


Gate Charge Characteristics

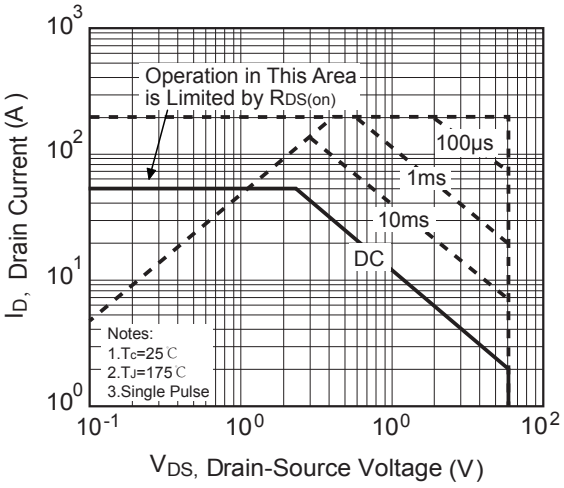
Typical Characteristics



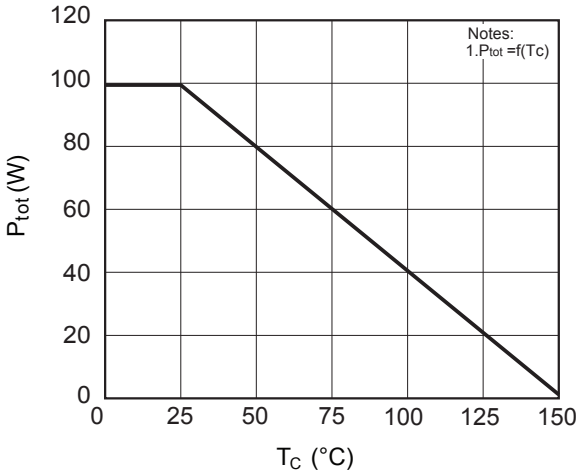
Breakdown Voltage Variation vs. Temperature



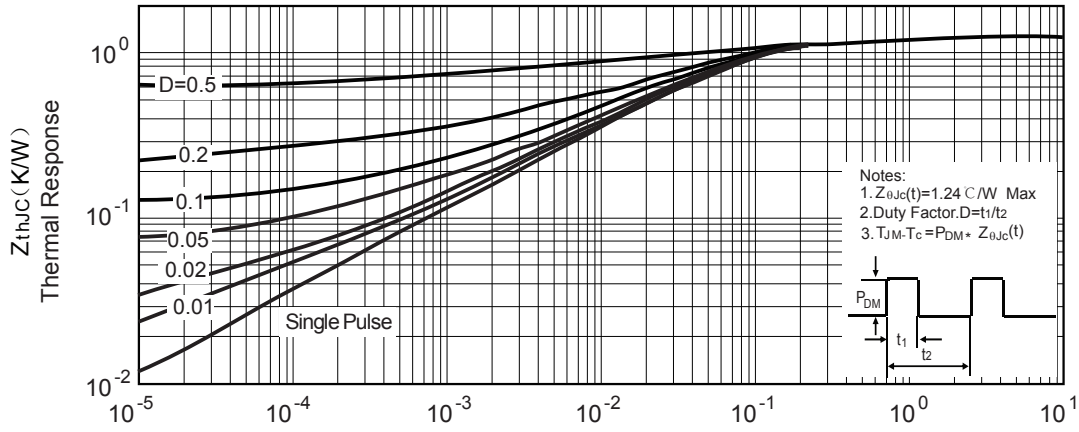
On-Resistance Variation vs. Temperature



Maximum Safe Operating Area



Power dissipation



Transient Thermal Response Curve