CMH52N50/CMA52N50

500V, 100mΩ typ., 52A N-Channel MOSFET

General Description

The 52N50 uses advanced planar stripe DMOS technology and design to provide excellent RDS(ON).These devices are well suited for high-efficiency switched mode power supplies and active power factor correction.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
500V	110mΩ	52A

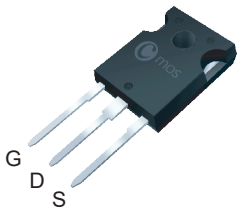
Applications

- Switch Mode Power Supply
- PFC

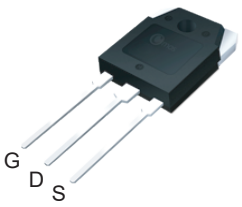
Features

- Improved dv/dt capability
- 100% avalanche tested
- RoHS Compliant

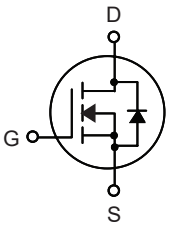
TO-247/TO-3P Pin Configuration



TO-247
CMH52N50



TO-3P
CMA52N50



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D@T_C=25℃	Continuous Drain Current	52	A
I_D@T_C=100℃	Continuous Drain Current	40	A
I_{DM}	Pulsed Drain Current	208	A
EAS	Single Pulse Avalanche Energy (Note 1)	4205	mJ
P_D@T_C=25℃	Total Power Dissipation	625	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.2	℃/W

500V, 100mΩ typ., 52A N-Channel MOSFET

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	500	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=25A	---	100	110	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250μA	2.0	---	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=500V , V_{GS}=0V	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=25V , I_D =25A	---	44	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	0.8	---	Ω
Q_g	Total Gate Charge	V_{DS} =400V , I_D=23A V_{GS}=10V (note 2,3)	---	180	---	nC
Q_{gs}	Gate-Source Charge		---	39	---	
Q_{gd}	Gate-Drain Charge		---	57	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=250V , I_D =23A R_G=25Ω (note 2,3)	---	62	---	ns
T_r	Rise Time		---	24	---	
$T_{d(off)}$	Turn-Off Delay Time		---	188	---	
T_f	Fall Time		---	23	---	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V , f=1MHz	---	10400	---	pF
C_{oss}	Output Capacitance		---	700	---	
C_{rss}	Reverse Transfer Capacitance		---	65	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	52	A
I_{SM}	Pulsed Source Current		---	---	208	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=52A	---	0.88	1.5	V
t_{rr}	Reverse Recovery Time	I_S =50A , V_{GS} =0V di/dt =100A/μs (note 2,3)	---	487	---	ns
Q_{rr}	Reverse Recovery Charge		---	6.9	---	μC

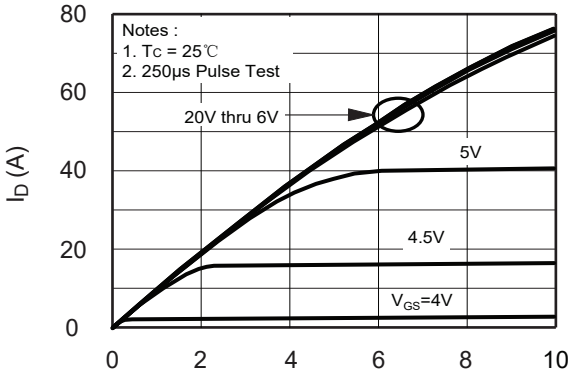
Note :

1.The EAS data shows Max. rating .The test condition is V_{DS}=100V , V_{GS}=10V , L=10mH , I_{AS}=29A.

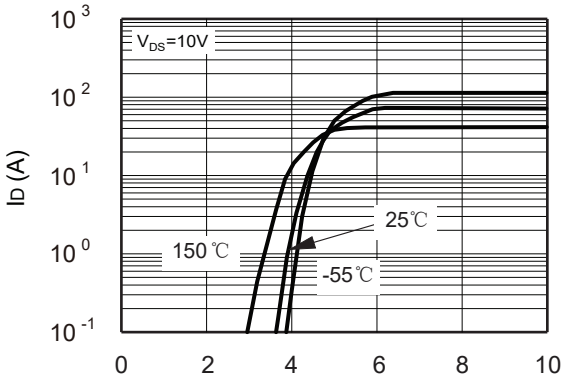
2. Pulse test: Pulse width≤300us, Duty cycle≤2%.

3. Essentially independent of operating temperature typical characteristics.

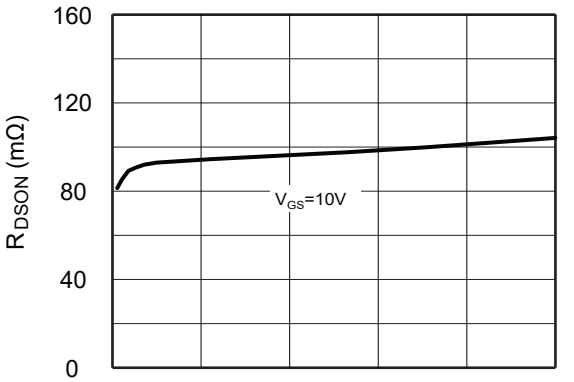
Typical Characteristics



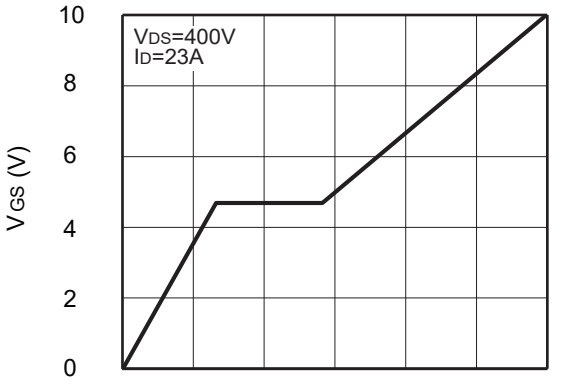
Output Characteristics



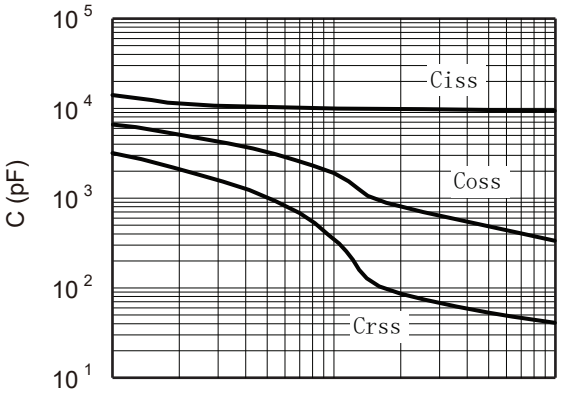
transfer characteristics



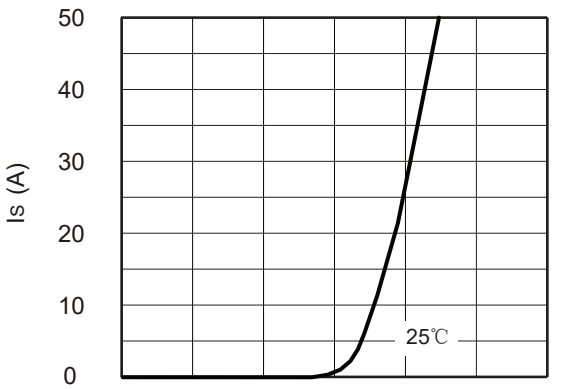
On-Resistance vs. Drain Current



Gate charge vs gate-source voltage

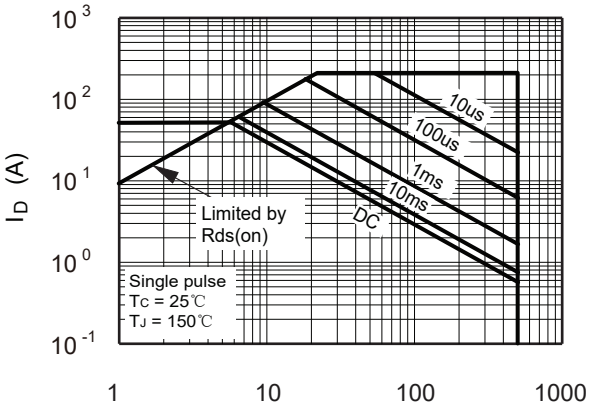


Capacitance Characteristics

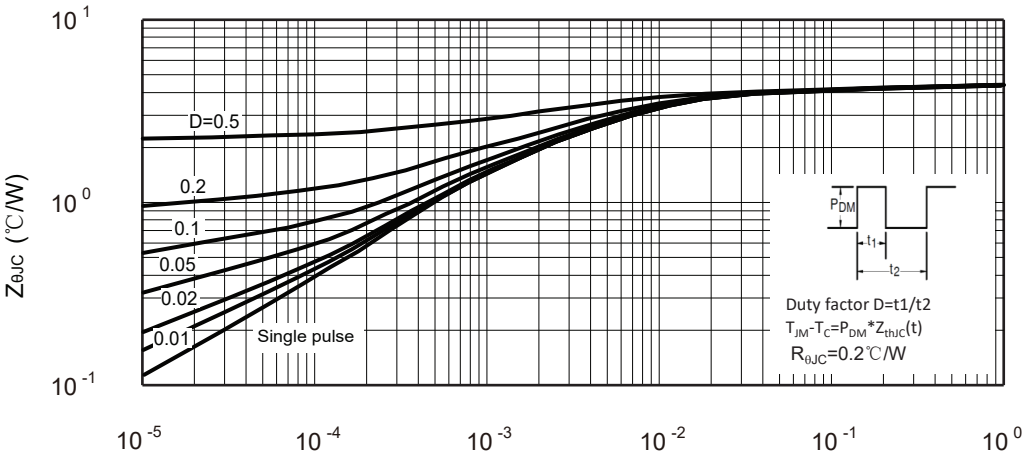


Body-Diode Characteristics

Typical Characteristics



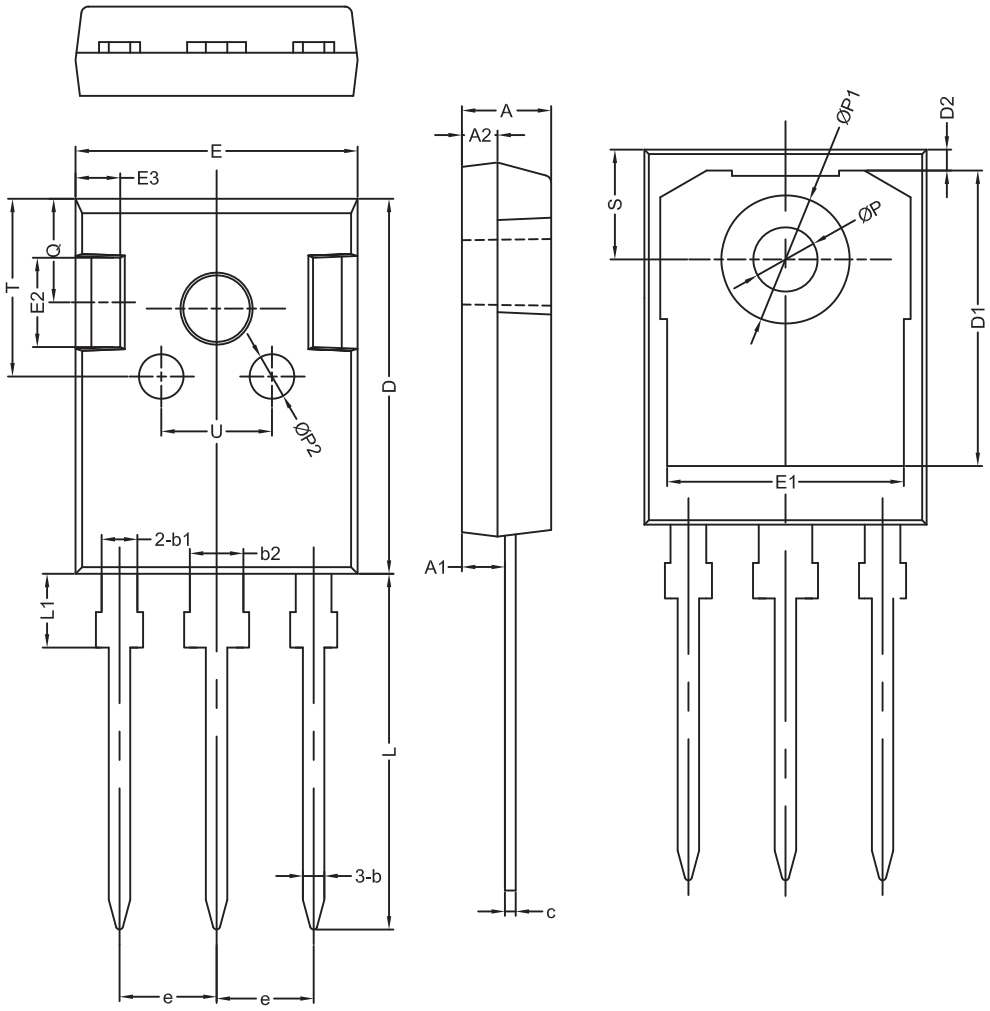
Safe Operating Area



Max.Transient thermal impedance

Package Dimension

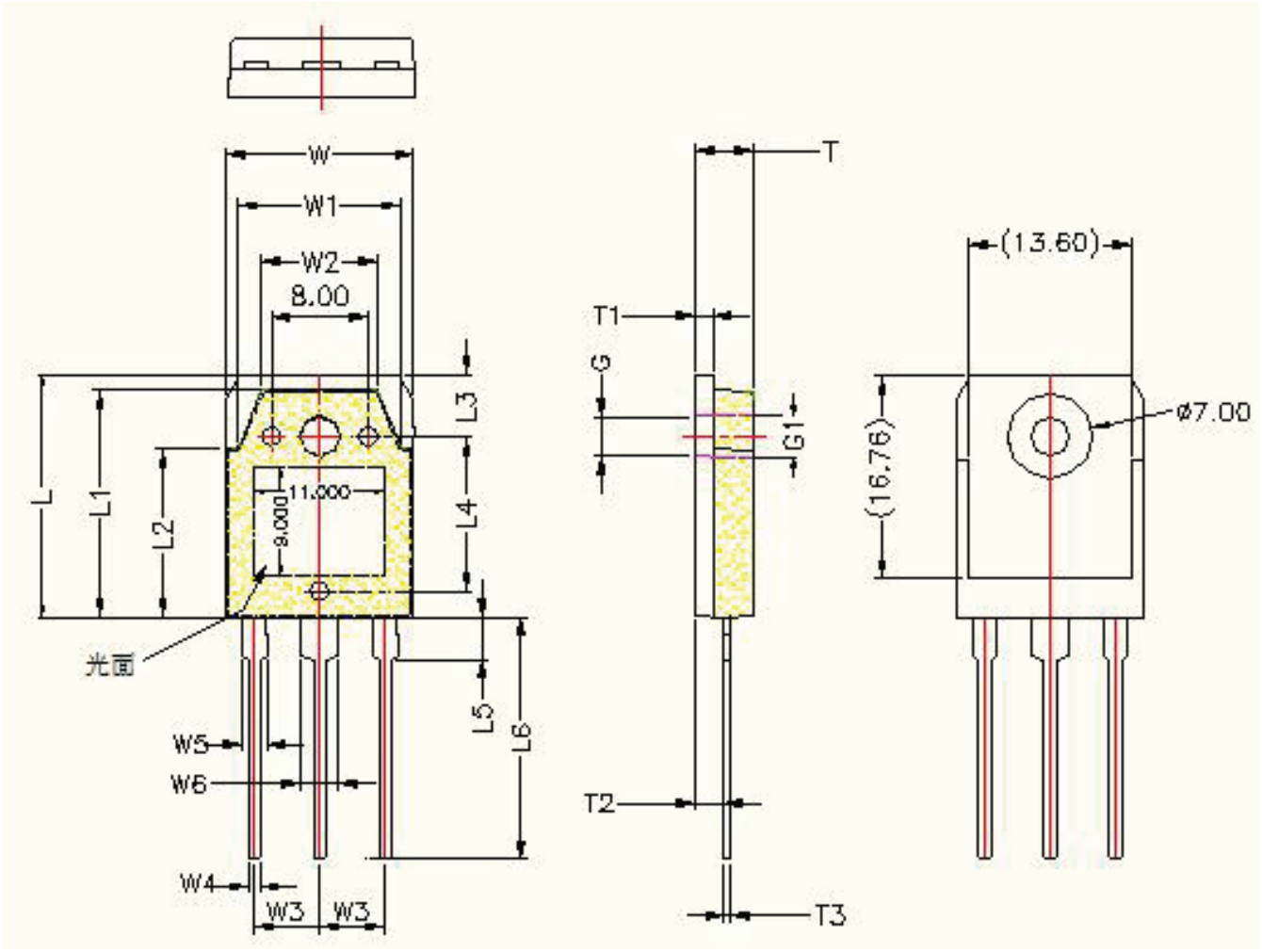
TO-247 Unit :mm



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	

Package Dimension

TO-3P Unit :mm



Symbol	Dimensions	Symbol	Dimensions	Symbol	Dimensions
W	15.60±0.3	L	19.90±0.3	T	4.80±0.3
W1	13.60±0.3	L1	18.70±0.3	T1	1.50±0.3
W2	9.60±0.3	L2	13.90±0.3	T2	2.40±0.3
W3	5.45(TYP)	L3	5.00±0.3	T3	0.60±0.3
W4	1.00±0.3	L4	12.76±0.3	G	Ø3.25±0.3
W5	2.10±0.2	L5	3.50±0.3	G1	Ø3.58±0.3
W6	3.10±0.2	L6	20.00±0.3		