CMD9N20 / CMU9N20

200V, 0.35Ω typ., 9A N-Channel MOSFET

General Description

The 9N20 uses advanced planar stripe DMOS technology and design to provide excellent RDS(ON).This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
200V	0.4Ω	9A

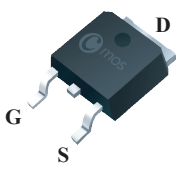
Applications

- PWM Motor Controls
- LED TV
- DC-DC Converters

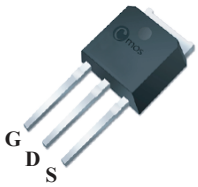
Features

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

TO-252/251 Pin Configuration



TO-252
(CMD9N20)



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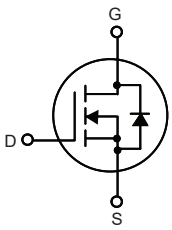

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	9	A
I_D@T_C=100℃	Continuous Drain Current	6.5	A
I_{DM}	Pulsed Drain Current	36	A
EAS	Single Pulse Avalanche Energy[1]	141	mJ
I_{AR}	Avalanche Current	9	A
P_D@T_C=25℃	Total Power Dissipation	50	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	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	2.5	℃/W

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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	200	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=3A	---	0.35	0.4	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= 200V , V_{GS}=0V	---	---	25	uA
		V_{DS}=160V , V_{GS}=0V , T_J=150℃	---	---	250	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V	---	---	±100	nA
gfs	Forward Transconductance[2]	V_{DS}=10V, I_D=4.5A	---	5.5	---	S
Q_g	Total Gate Charge[2]	V_{DS}=160V , V_{GS}=10V , I_D=9.5A	---	20	---	nC
Q_{gs}	Gate-Source Charge[2]		---	3.5	---	
Q_{gd}	Gate-Drain Charge[2]		---	10	---	
$T_{d(on)}$	Turn-On Delay Time[2]	V_{DD}=100V, I_D=9.5A , R_G=25Ω	---	10	---	ns
T_r	Rise Time[2]		---	90	---	
$T_{d(off)}$	Turn-Off Delay Time[2]		---	70	---	
T_f	Fall Time[2]		---	70	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	420	---	pF
C_{oss}	Output Capacitance		---	115	---	
C_{rss}	Reverse Transfer Capacitance		---	35	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	9	A
I_{SM}	Pulsed Source Current		---	---	36	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=9A ,T_J=25℃	---	0.94	1.5	V
t_{rr}	Reverse Recovery Time	di/dt = 100A/μs	---	160	---	ns
Q_{rr}	Reverse Recovery Charge	V_{GS}=0V , I_S =9A	---	1.0	---	μC

Note :

1.The EAS data shows Max. rating . The test condition is V_{DD}=50V , V_{GS}=10V ,L= 6.5mH , I_{AS}=6.6A.

2.The data tested by pulsed , pulse width ≤ 400us , duty cycle ≤ 2%.

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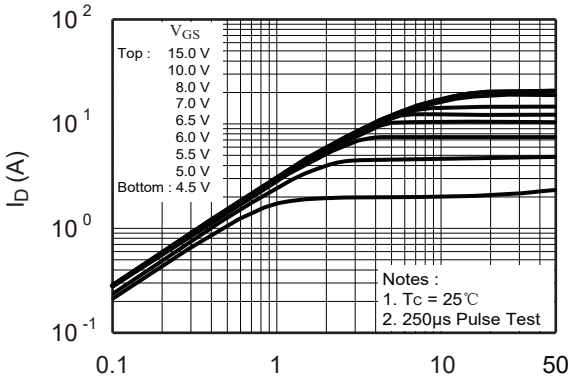
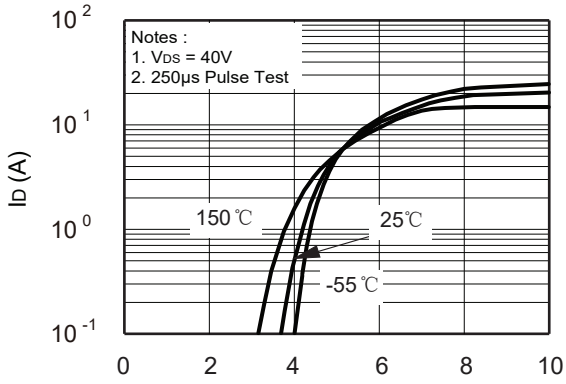
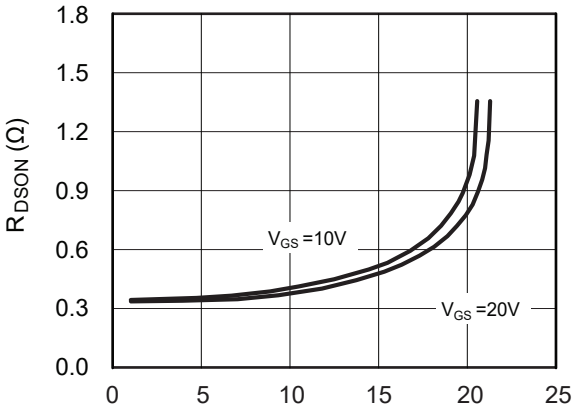
Typical Characteristics



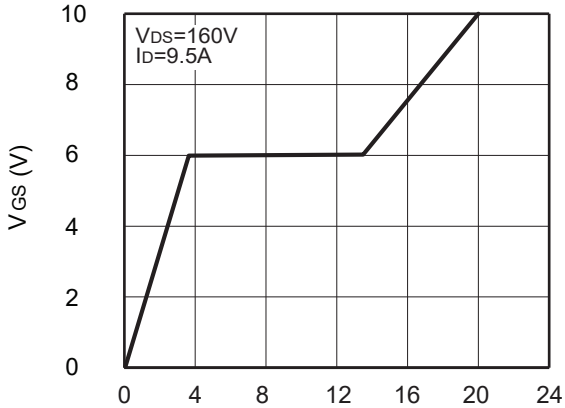
Output Characteristics



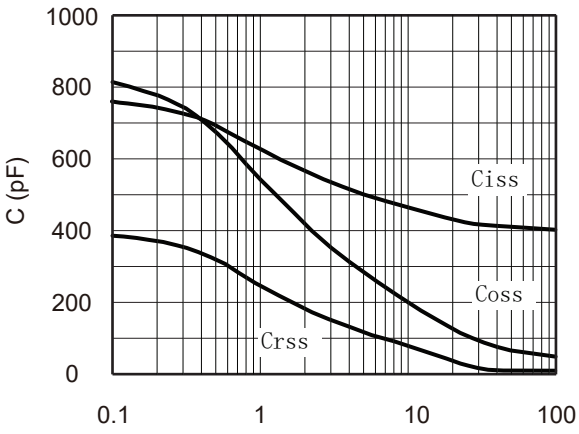
transfer characteristics



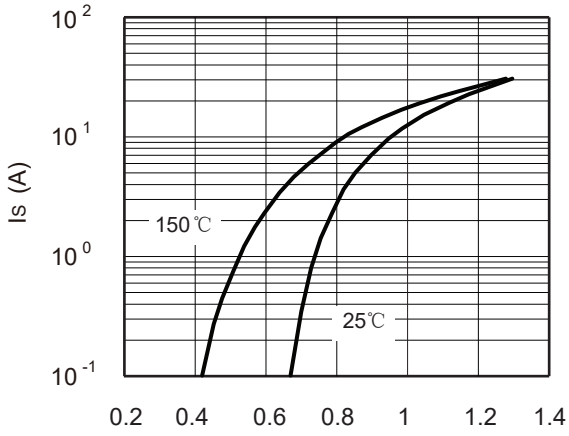
On-Resistance vs. Drain Current



Gate charge vs gate-source voltage



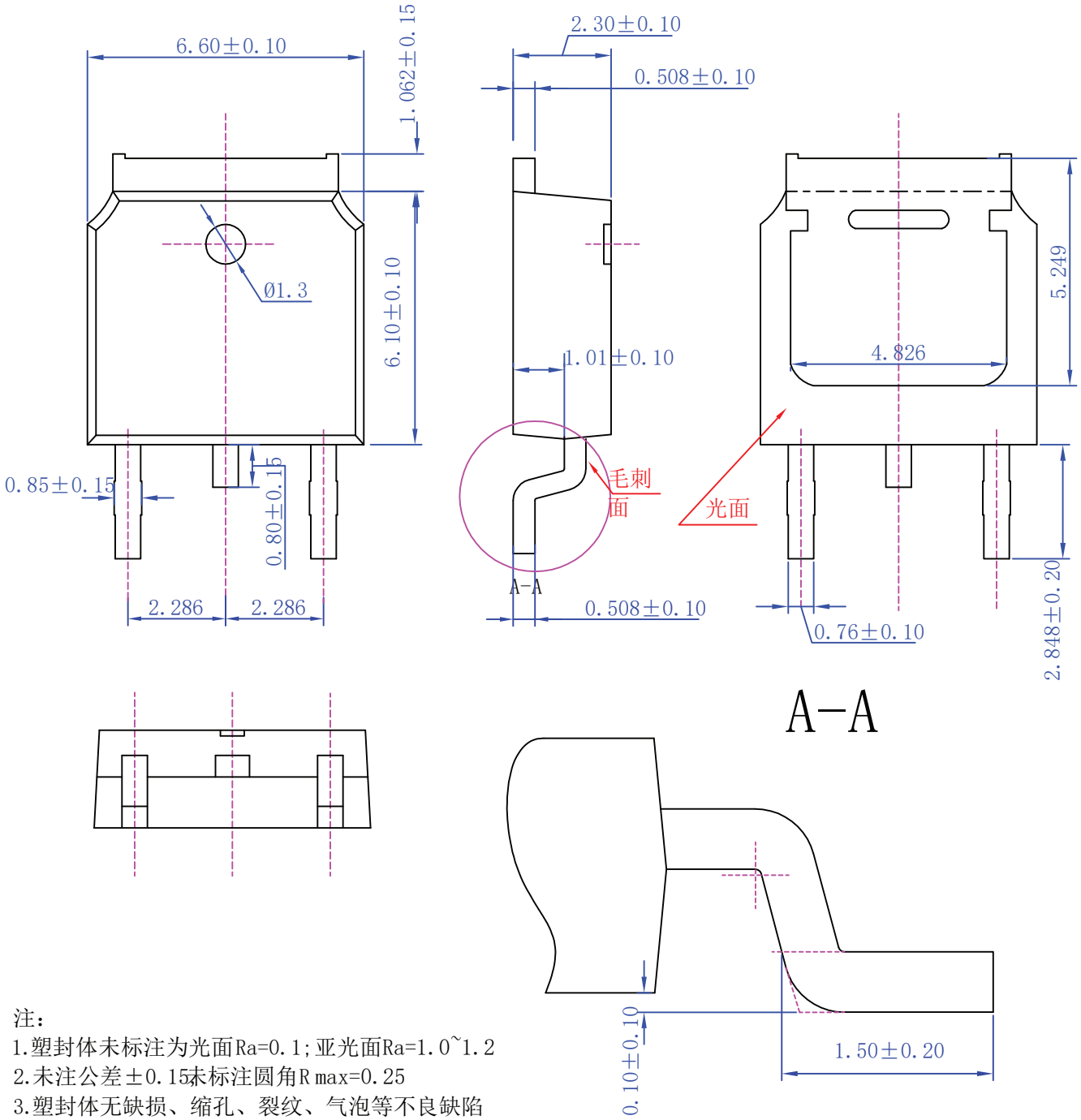
Capacitance Characteristics



Body-Diode Characteristics

Package Dimension

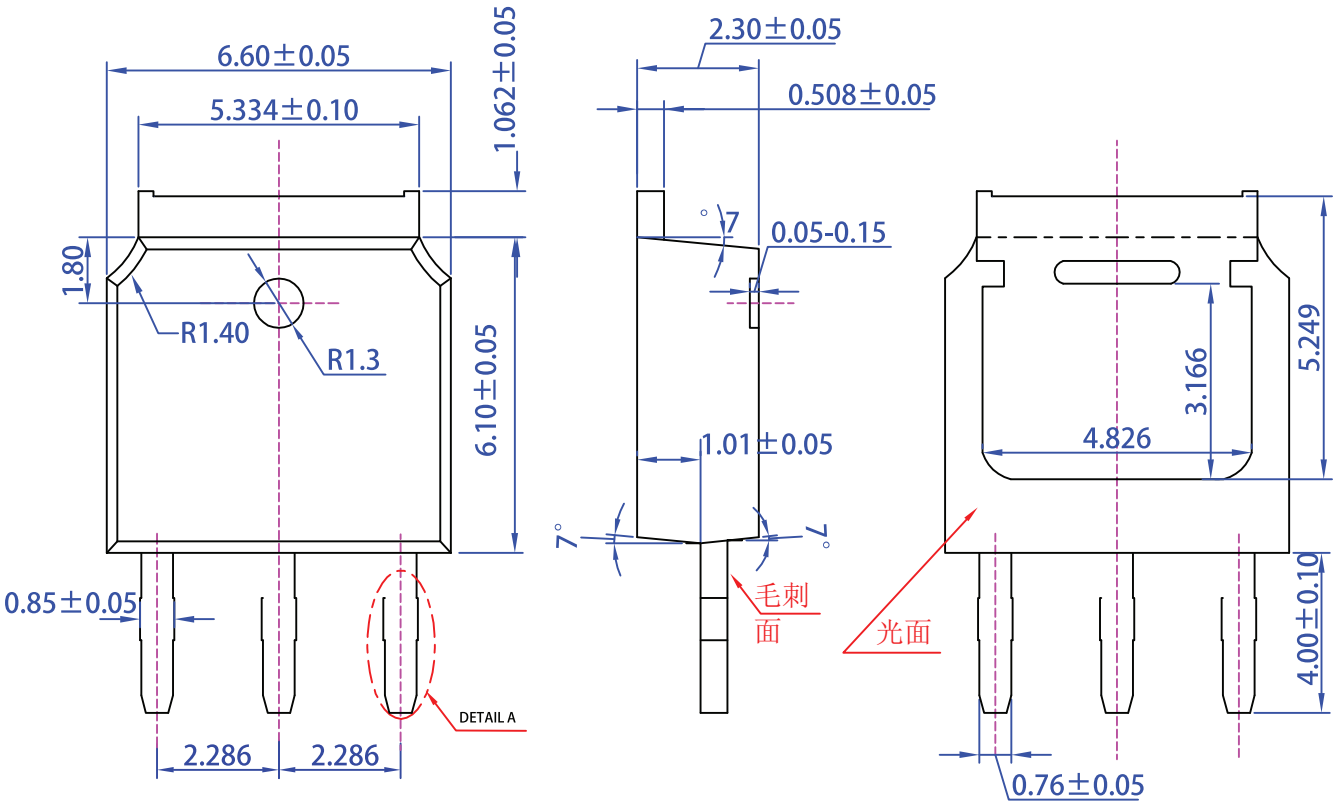
TO-252 Unit :mm

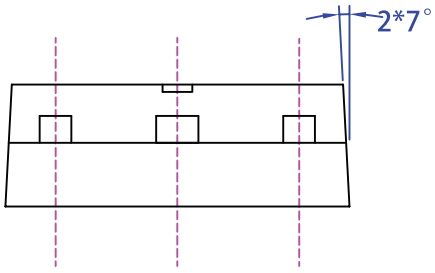


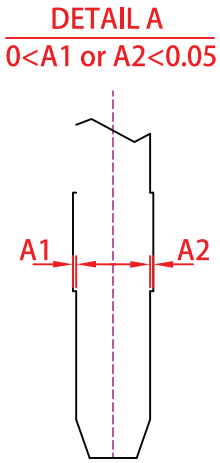
注：
1.塑封体未标注为光面Ra=0.1;亚光面Ra=1.0~1.2
2.未注公差±0.15未标注圆角R max=0.25
3.塑封体无缺损、缩孔、裂纹、气泡等不良缺陷
4.标注单位mm
5.顶针孔不允许凸出塑封体表面

Package Dimension

TO-251A Unit :mm







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Note: For the most current drawings please refer to the Cmos website @http://www.cmosfet.om