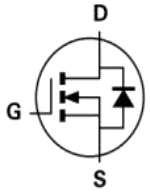
CS60N20A

N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

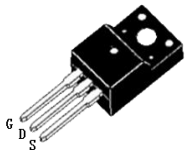
I_D	60A
V_{DSS}	200V
RDSON-typ （@VGS=10V）	40mΩ



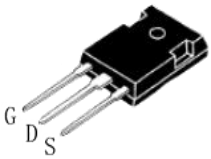
FEATURES

This device is suitable for use as a

Battery protection or in other Switching application.



TO-220F



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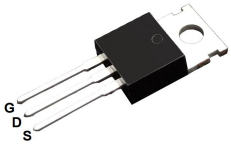
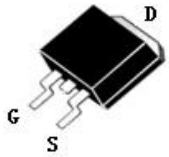
APPLICATIONS

- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)



TO-220C



TO-263C

MECHANICAL DATA

- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275℃ maximum,10s per JESD 22-B106

Product specification classification

Part Number	Package	Mode Name	Pack
CS60N20A8	TO-220F(1.3mm)	CS60N20A	Tube
CS60N20A6	TO-247	CS60N20A6	Tube
CS60N20AP	TO-220C	CS60N20AP	Tube
CS60N20AT	TO-263C	CS60N20AT	Tube

CS60N20A

N-Channel Enhancement Mode MOSFET

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	60	A
Pulsed Drain Current (Note1)	I_{DM}	220	A
Power Dissipation	P_D	250	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	1700	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250 μA	BV_{DSS}	200	-	-	V
Drain-Source Leakage Current	V_{DS} = 200 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	V_{GS} = 10 V, I_D = 30A	$R_{DS(on)}$	-	40	48	mΩ
Input Capacitance	VDS=25V , VGS=0V , f=1MHz	C_{iss}	-	2819	-	pF
Output Capacitance		C_{oss}	-	394	-	pF
Reverse Transfer Capacitance		C_{rss}	-	34	-	pF
Turn-on Delay Time(Note2)	VDD=100V , VGS=10V , RG=10Ω , ID=50A	$t_{d(ON)}$	-	35.7	-	ns
Rise Time(Note2)		t_r	-	38.9	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	74.7	-	ns
Fall Time(Note2)		t_f	-	21.9	-	ns
Total Gate Charge(Note2)	VDS=160V , VGS=10V , ID=50A	Q_G	-	49.4	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	13	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	18	-	nC

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbo	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	60	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	220	A
Drain-Source Diode Forward Voltage	VGS=0V , IS=50A , TJ=25℃	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	T_J = 25℃, I_F= 50A di / dt = 100 A/μs	trr	-	208	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	2.04	-	μC

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

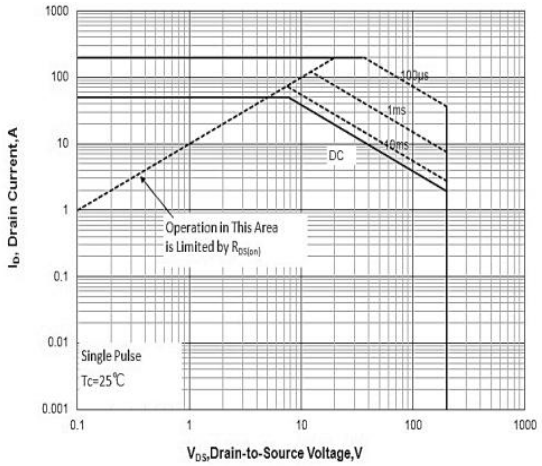


Figure 1 Maximum Forward Bias Safe Operating Area

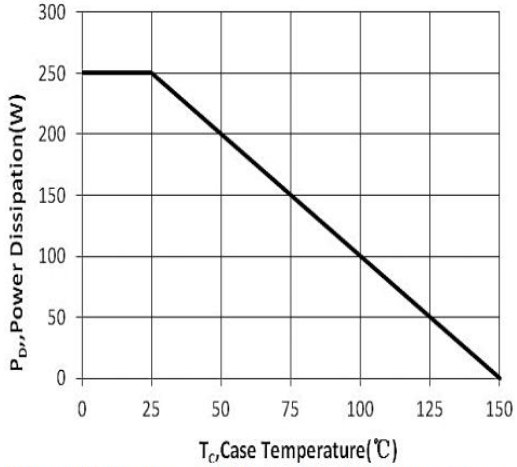


Figure 2 Maximum Power dissipation vs Case Temperature

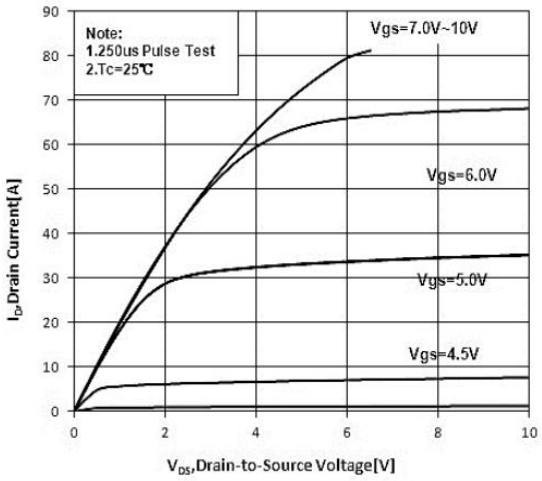


Figure 3 Maximum Continuous Drain

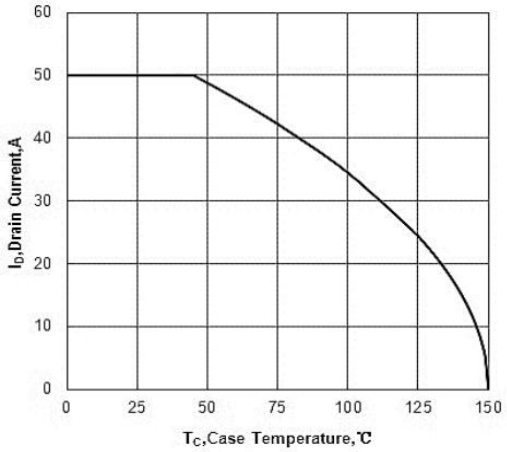


Figure 4 Typical Output Characteristics

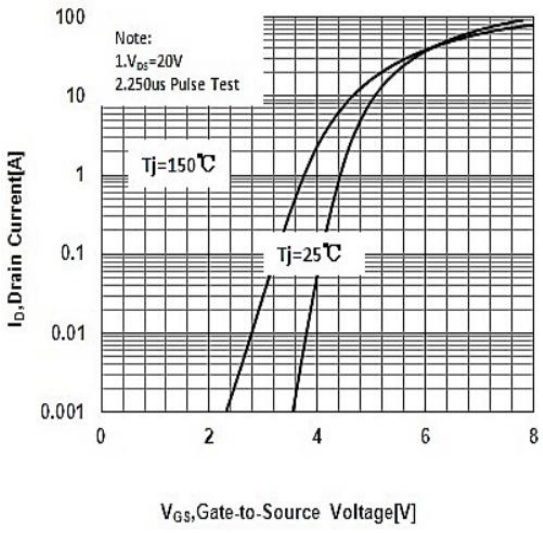


Figure5:Typical Transfer Characteristics

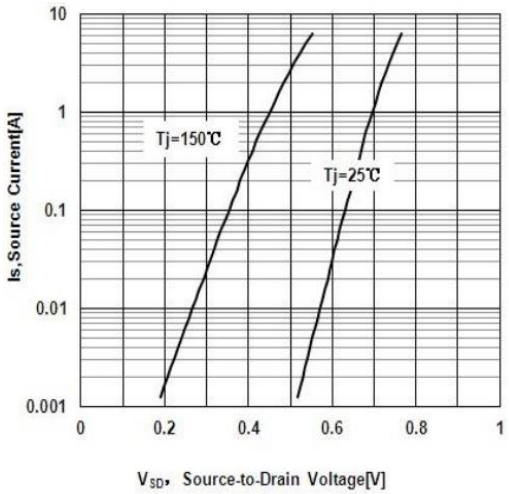


Figure6:Typical Body Diode Transfer Characteristics

RATINGS AND CHARACTERISTIC CURVES

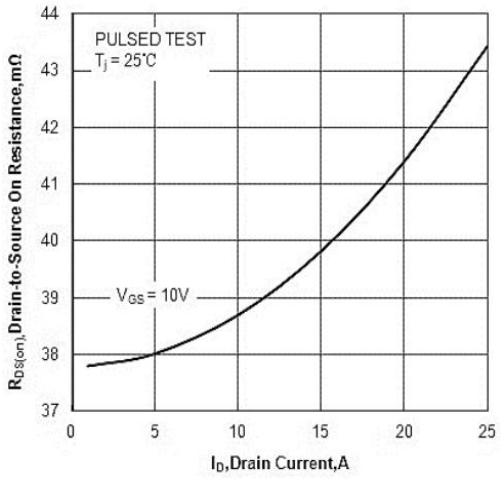


Figure7: Typical Drain to Source ON Resistanc vs Junction Temperature

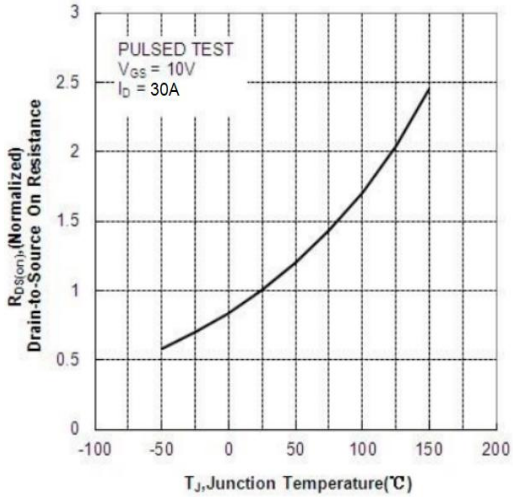


Figure8 Typical Drian to Source on Resistance vs Drain Current

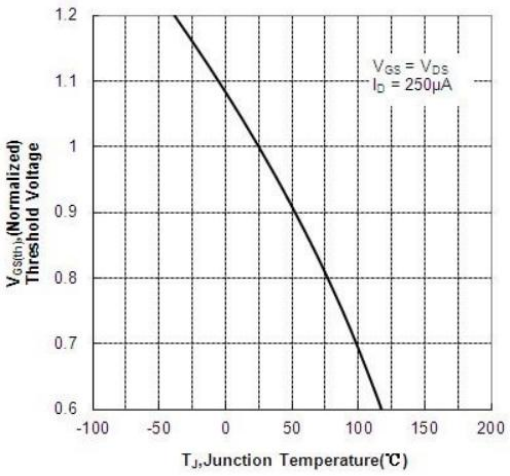


Figure 9 Typical Theshold Voltage vs Junction Temperature

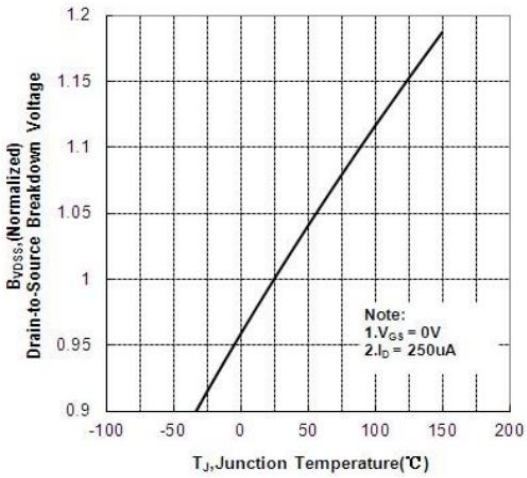


Figure 10 Typical Breakdown Voltage vs Junction Temperature

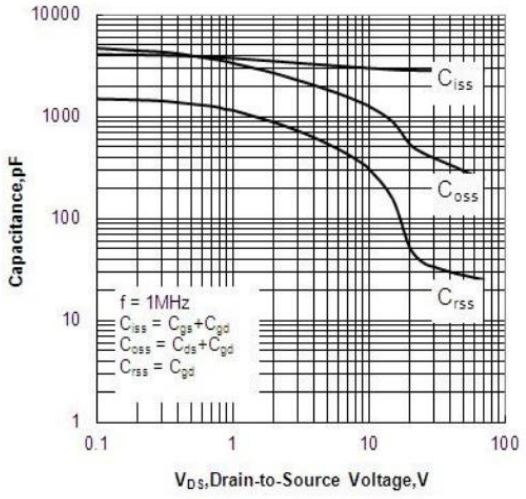


Figure 11 Typical Capacitance vs Drain to Source Voltage

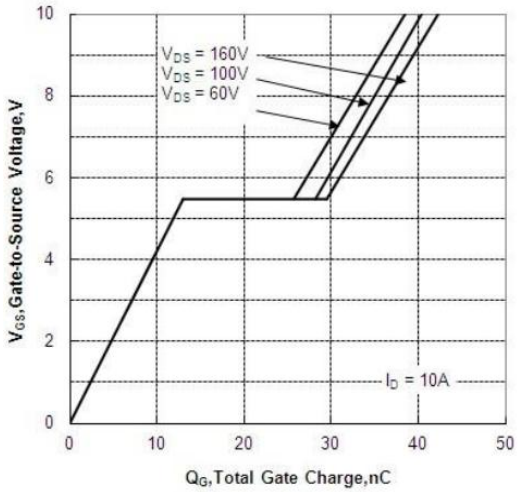
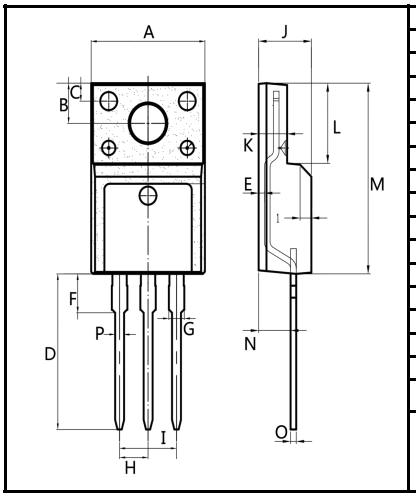


Figure 12 Typical Gate Charge vs Gate to Source Voltage

Package Outline Dimensions millimeters

TO-220F



Dim.	Min.	Max.
A	9.95	10.25
B	2.95	3.25
C	1.25	1.45
D	12.8	13.2
E	0.4	0.6
F	2.8	3.5
G	1.3	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.5	5
K	2.45	2.65
L	6.5	6.8
M	15.4	16
N	2.75	3.05
O	0.45	0.55
P	0.7	0.9
All Dimensions in millimeter		

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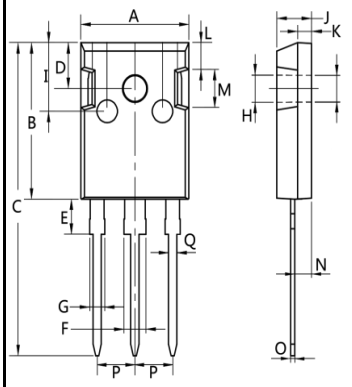
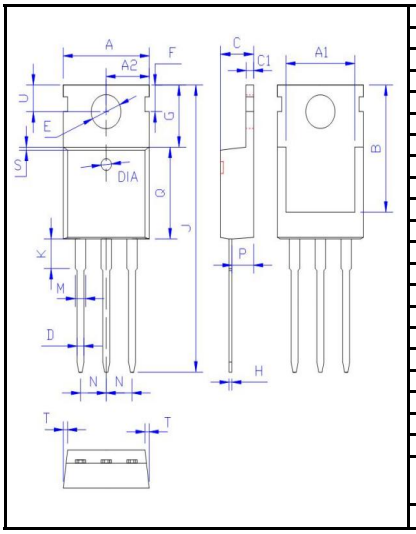


Dim.	Min.	Max.
A	15	16
B	20	21
C	40	42
D	5.5	6.5
E	4	5.5
F	2.5	3.5
G	1.75	2.5
H	3	4
I	8	10
J	4.9	5.1
K	1.9	2.1
L	3.5	4
M	4.75	5.25
N	2	3
O	0.55	0.75
P	Typ 5.4	
Q	1.17	1.3

TO-220C



Dim.	Min.	Max.
A	9.8	10.2
A1	7.8	8.2
A2	4.8	5.2
B	13	13.4
C	4.35	4.65
C1	1.15	1.45
D	0.65	0.95
E	3.45	3.75
F	2.85	3.15
G	6.4	6.8
H	0.35	0.65
J	28.68	29.08
K	2.8	3.2
M	1.15	1.45
N	Typ2.54	
P	2.2	2.6
Q	9	9.4
S	0.15	0.35
T	0.15	0.35
U	2.65	2.95
DIA	直径1.5±0.1 深MAX0.5	
All Dimensions in millimeter		

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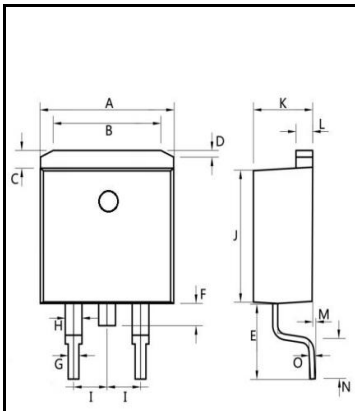
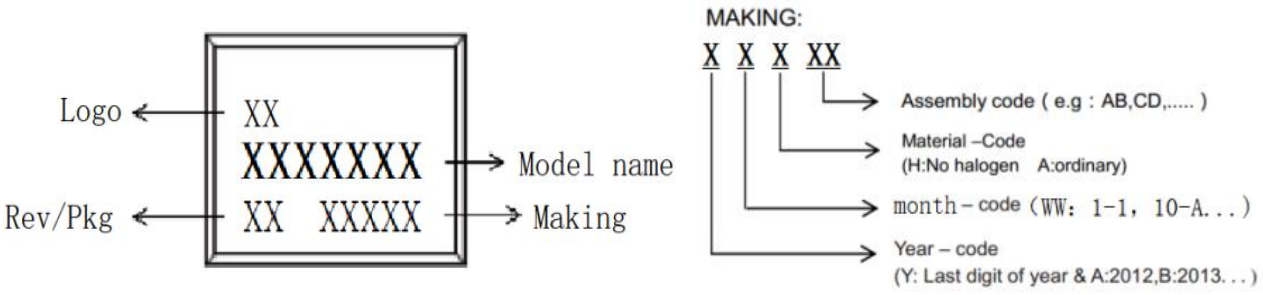
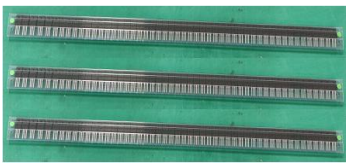
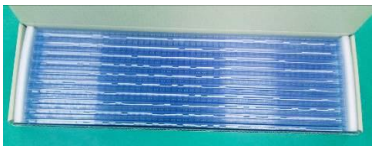
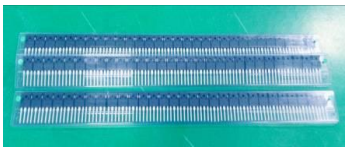


Dim.	Min.	Max.
A	9.8	10.2
B	6.1	6.7
C	1.1	1.4
D	0.5	1.0
E	4.6	5.0
F	1.4	1.6
G	0.7	0.9
H	1.17	1.37
I	Typ2.54	
J	9	9.2
K	4.3	4.7
L	1.25	1.35
M	0.02	0.23
N	2.2	2.8
O	0.45	0.55
All Dimensions in millimeter		

Marking on the body



packing instruction

PKG	最小包装	内盒	外箱
TO-220F TO-220C TO-263C			
	50pcs/管	1000pcs/盒	5000pcs/箱
TO-247			
	30PCS/管	600pcs/盒	2400pcs/箱
TO-263C			
	800pcs/盘	1600pcs/盒	8000pcs/箱

Notice

All product,product specifications and data are subject to change without notice to improve.The right to explain is owned by LINGXUN electronics company.

Confirm that operation temperature is within the specified range described in the product specification. Avoid applying poer exceeding normal rated poer; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

LINGXUN electronics shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.