

MAIN CHARACTERISTICS

I_D	13A
V_{DSS}	500V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$)	0.37 Ω

FEATURES

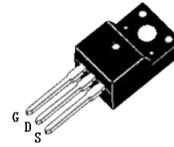
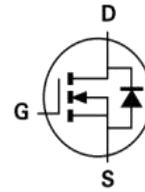
- Fast Switching
- Low ON Resistance
- Low Gate Charge
- 100% Single Pulse avalanche energy Test

APPLICATIONS

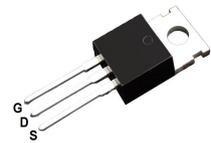
- Power switch circuit of adaptor and charger.

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 $^{\circ}C$ maximum, 10s per JESD 22-B106



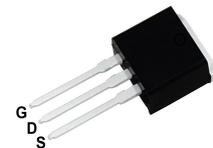
TO-220F



TO-220C



TO-263C



TO-262C

Product specification classification

Part Number	Package	Mode Name	Pack
CS13N50A2	TO-220F (0.5mm)	CS13N50A	Tube
CS13N50A8	TO-220F (1.3mm)	CS13N50A	Tube
CS13N50AP	TO-220C	CS13N50A	Tube
CS13N50AT	TO-263C	CS13N50A	Tube
CS13N50AT-R	TO-263C	CS13N50A	Tape
CS13N50AI	TO-262C	CS13N50A	Tube



CS13N50A

N-Channel Enhancement Mode Power MOSFET

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value		Unit
		220F	220C/263C/262C	
Drain-Source Voltage	V_{DS}	500		V
Gate-Source Voltage	V_{GS}	±30		V
Continue Drain Current	I_D	13		A
Pulsed Drain Current (Note1)	I_{DM}	52		A
Power Dissipation	P_D	50	210	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	840		mJ
Operating Temperature Range	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	0.59	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	62.5	°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	$V_{GS} = 0 V, I_D = 250 \mu A$	BV_{DSS}	500	-	-	V
Drain-Source Leakage Current	$V_{DS} = 500 V, V_{GS} = 0 V$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30 V, V_{DS} = 0 V$	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 6.5 A$	$R_{DS(on)}$	-	0.37	0.46	Ω
Forward Transconductance	$V_{DS} = 15 V, I_D = 6.5 A$	g_{fs}	-	13	-	S
Input Capacitance	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$	C_{iss}	-	1960	-	pF
Output Capacitance		C_{oss}	-	185	-	pF
Reverse Transfer Capacitance		C_{rss}	-	3	-	pF
Turn-on Delay Time(Note2)	$I_D = 13 A, V_{DD} = 250 V, R_G = 10 \Omega$	$t_{d(ON)}$	-	13	-	ns
Rise Time(Note2)		t_r	-	35	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	61	-	ns
Fall Time(Note2)		t_f	-	13	-	ns
Total Gate Charge(Note2)	$I_D = 13 A, V_{DD} = 400 V, V_{GS} = 10 V$	Q_G	-	35	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	8.5	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	10.3	-	nC

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

Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	13	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	52	A
Drain-Source Diode Forward Voltage	$I_{SD} = 13 A$	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_{SD} = 13 A, V_{GS} = 0 V, dl_F / dt = 100 A/\mu s$	t_{rr}	-	305	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	3.4	-	μC

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

RATINGS AND CHARACTERISTIC CURVES

Figure 1. Typical Output Characteristics

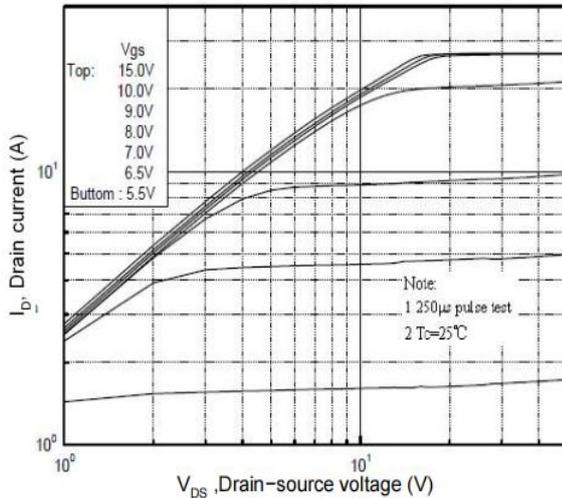


Figure 2. Transfer Characteristics

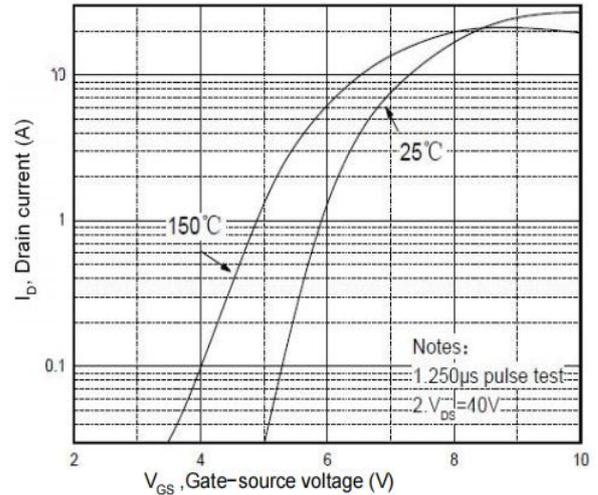


Figure 3. On-Resistance Variation vs. Drain Current

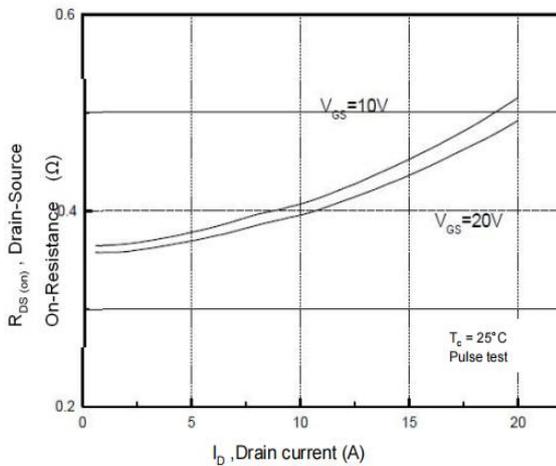


Figure 4. Threshold Voltage vs. Temperature

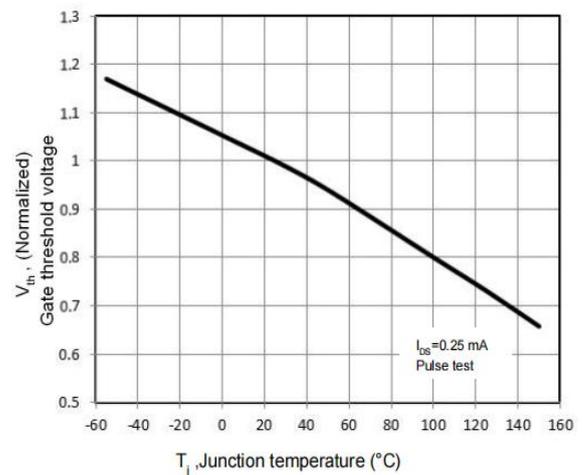


Figure 5. Breakdown Voltage vs. Temperature

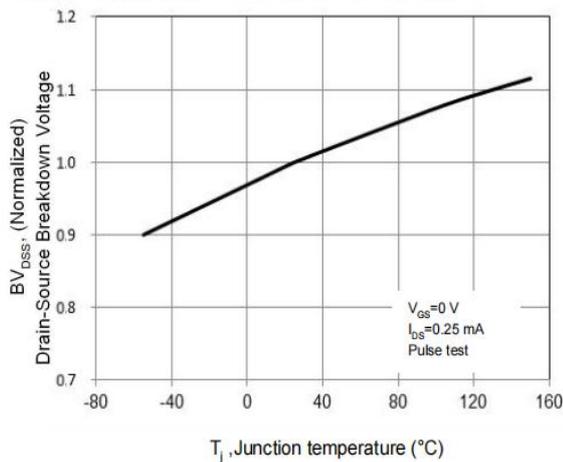
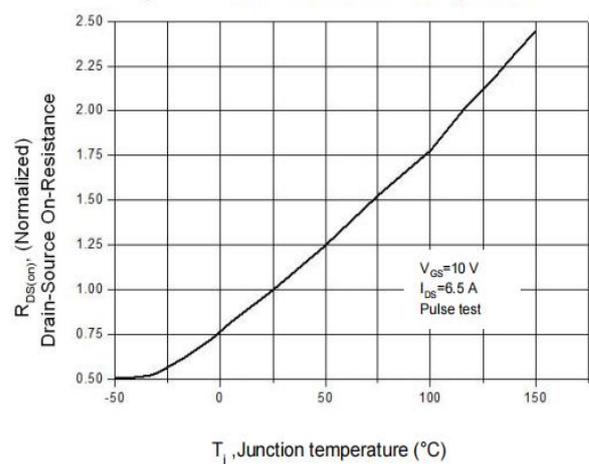


Figure 6. On-Resistance vs. Temperature



RATINGS AND CHARACTERISTIC CURVES

Figure 7. Capacitance Characteristics

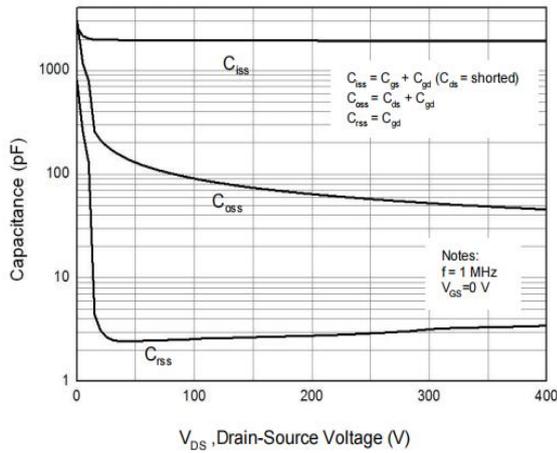


Figure 8. Gate Charge Characteristics

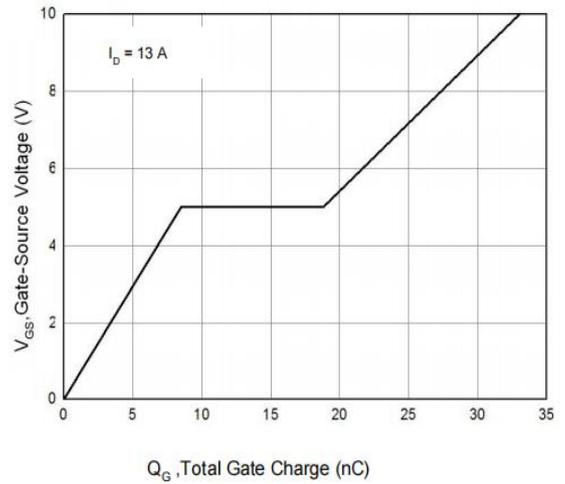


Figure 9. Maximum Safe Operating Area

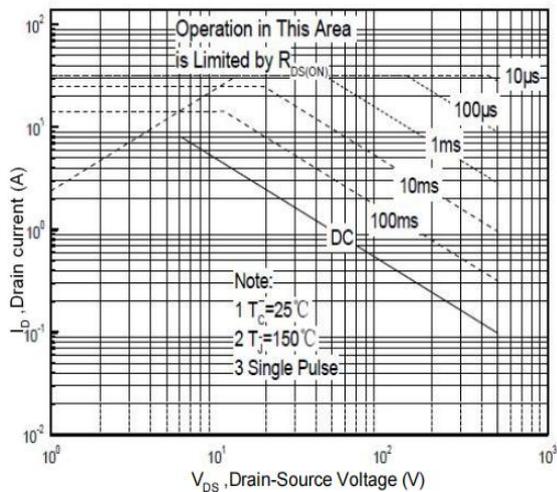


Figure 10. Power Dissipation vs. Temperature

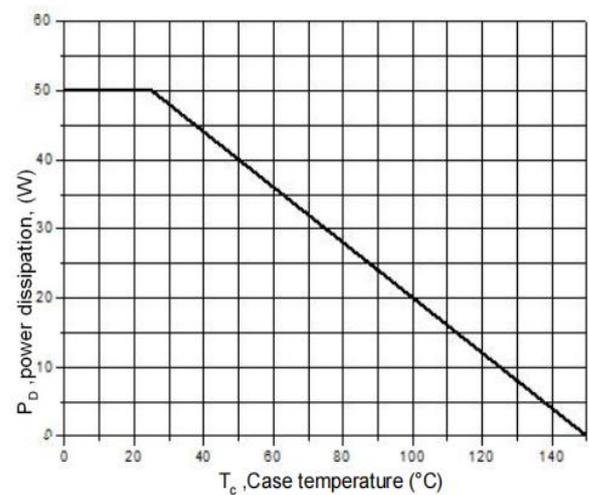
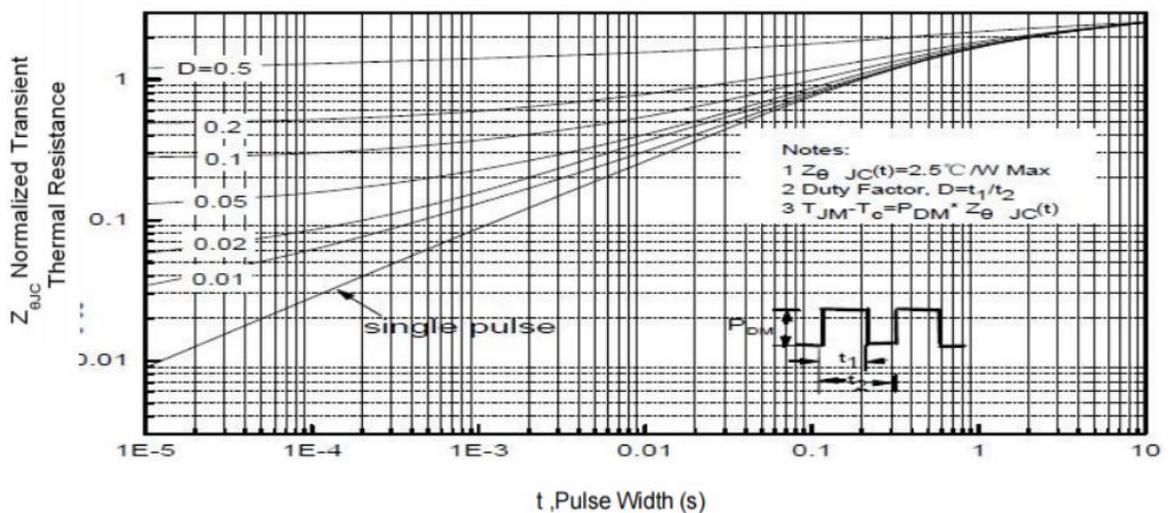
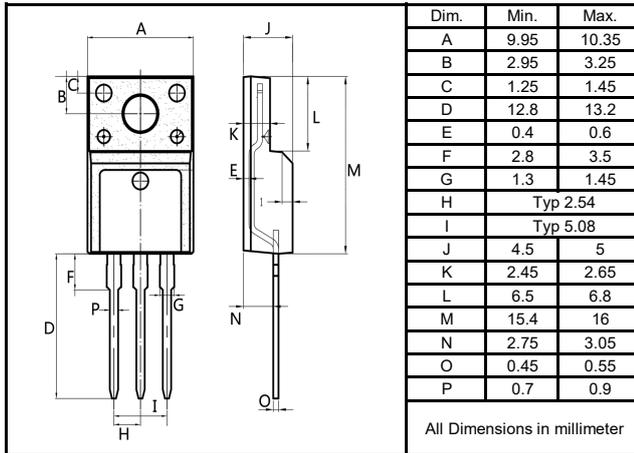
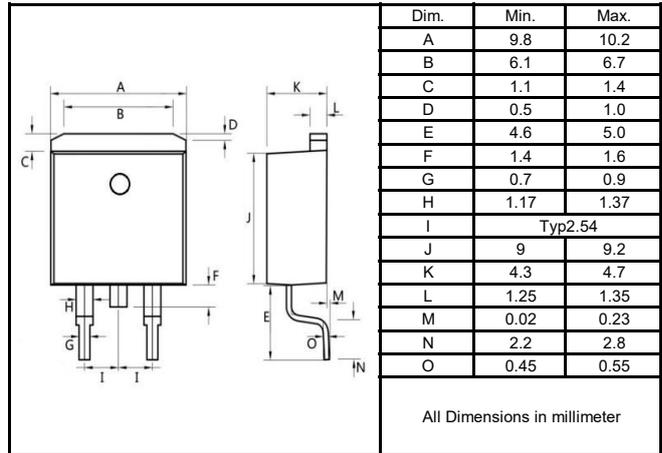
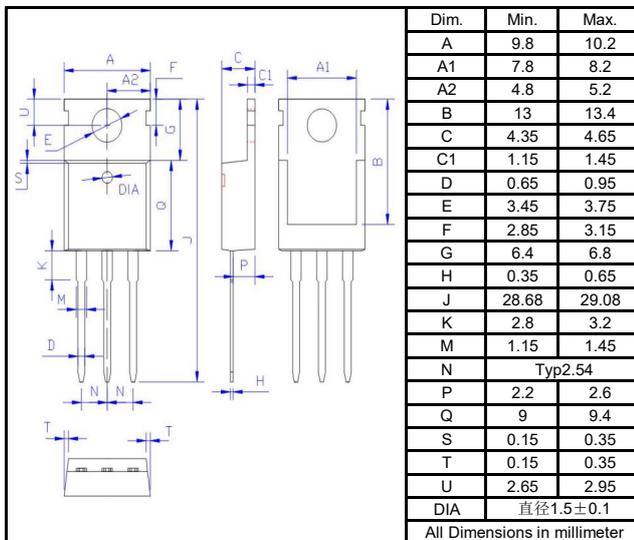
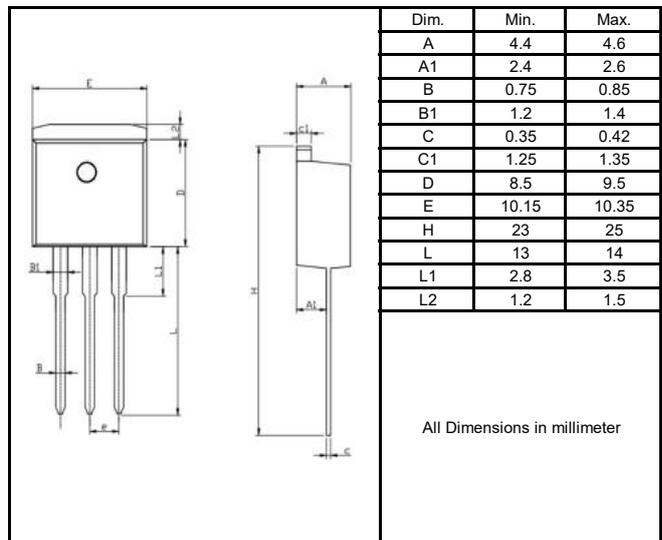


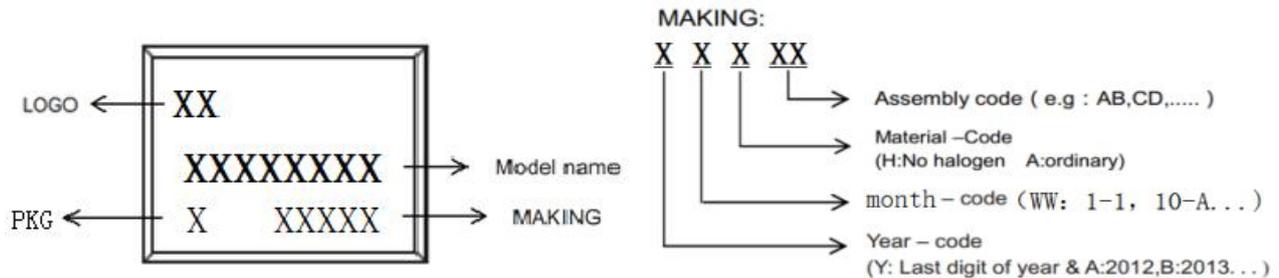
Figure 11 Transient Thermal Impedance, Junction to Case



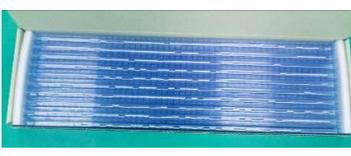
Package Outline Dimensions millimeters

T0-220F

T0-263C

T0-220C

T0-262C


Marking on the body



packing instruction

PKG	最小包装	内盒	外箱
TO-220F TO-220C TO-263C TO-262C			
	50pcs/管	1000pcs/盒	5000pcs/箱
TO-263C-R			
	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 power exceeding normal rated power; 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; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.