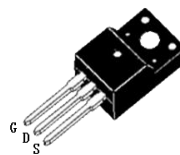
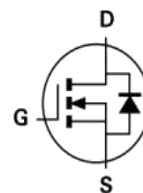


MAIN CHARACTERISTICS

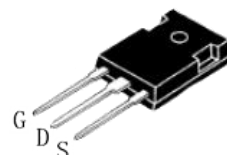
I_D	28A
V_{DSS}	650V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$)	0.32 Ω

FEATURES

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



TO-220F



TO-247

APPLICATIONS

- LED power supplies
- Cell Phone Charger
- Standby Power

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°C maximum, 10s per JESD 22-B106

Product specification classification

Part Number	Package	Mode Name	Pack
CS28N65A8	TO-220F (1.3mm)	CS28N65A	Tube
CS28N65A6	TO-247	CS28N65A	Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value		Unit
		247	220F	
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	± 30		V
Continue Drain Current	I_D	28		A
Pulsed Drain Current (Note1)	I_{DM}	112		A
Power Dissipation	P_D	260	35	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	675		mJ
Operating Temperature Range	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +150		°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.48	3.57	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	80	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbo	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650 \text{ V}, V_{GS} = 0 \text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30 \text{ V}, V_{DS} = 0 \text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 \text{ V}, I_D = 14 \text{ A}$	$R_{DS(on)}$	-	0.32	0.4	Ω
Input Capacitance	$V_{GS} = 0 \text{ V}, V_{DS} = 50 \text{ V}, f = 1\text{MHz}$	C_{iss}	-	2075	-	pF
Output Capacitance		C_{oss}	-	123	-	pF
Reverse Transfer Capacitance		C_{rss}	-	0.5	-	pF
Turn-on Delay Time(Note2)	$I_D = 14 \text{ A}, V_{DD} = 380 \text{ V}, R_G = 2.3 \Omega, V_{GS} = 10 \text{ V}$	$t_{d(ON)}$	-	14	-	ns
Rise Time(Note2)		t_r	-	12.3	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	65	-	ns
Fall Time(Note2)		t_f	-	11.2	-	ns
Total Gate Charge(Note2)	$I_D = 28 \text{ A}, V_{DD} = 480 \text{ V}, V_{GS} = 10 \text{ V}$	Q_G	-	37.2	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	13.4	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	11	-	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	-	-	28	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	112	A
Drain-Source Diode Forward Voltage	$I_{SD} = 28 \text{ A}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_{SD} = 14 \text{ A}, V_{GS} = 0 \text{ V},$	t_{rr}	-	350	-	ns
Reverse Recovery Charge(Note2)	$dI_F / dt = 100 \text{ A}/\mu\text{s}$	Q_{rr}	-	5.5	-	μC

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

Figure1. Safe operating area

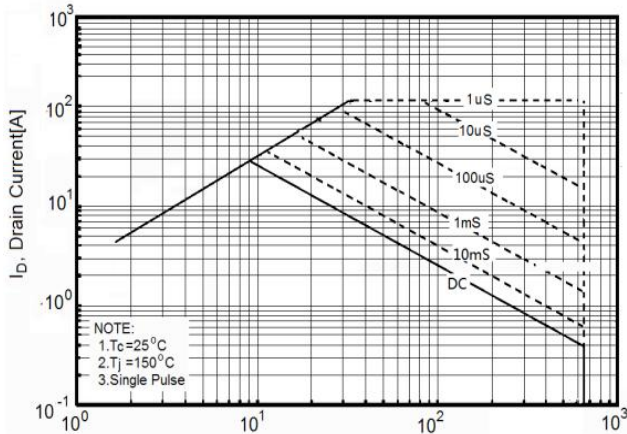


Figure2. Safe operating area for TO-220F

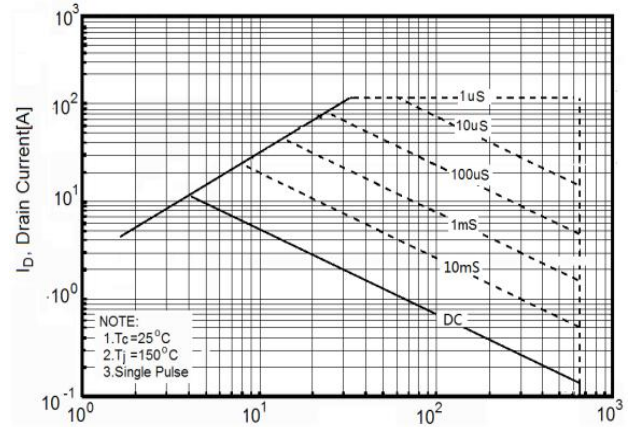


Figure3. Source-Drain Diode Forward Voltage

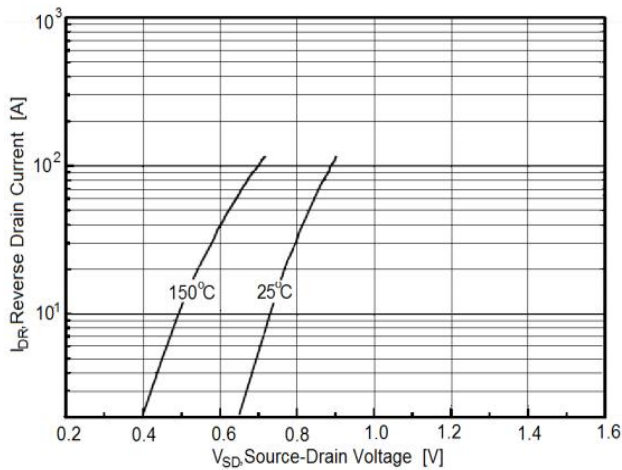


Figure4. Output characteristics

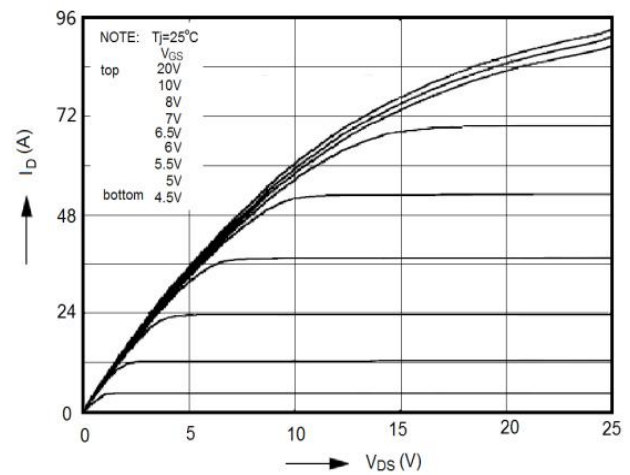


Figure5. Transfer characteristics

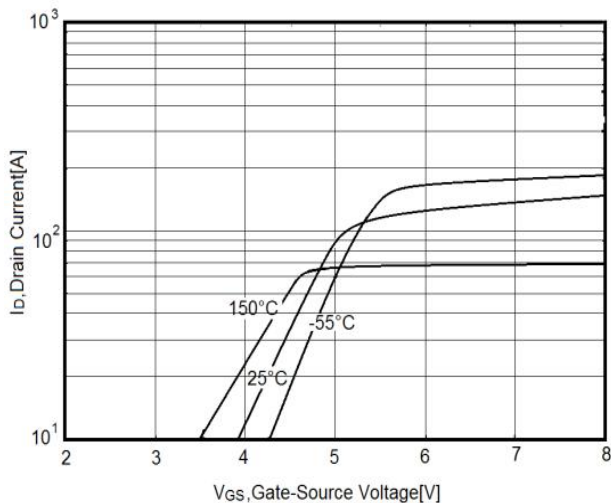
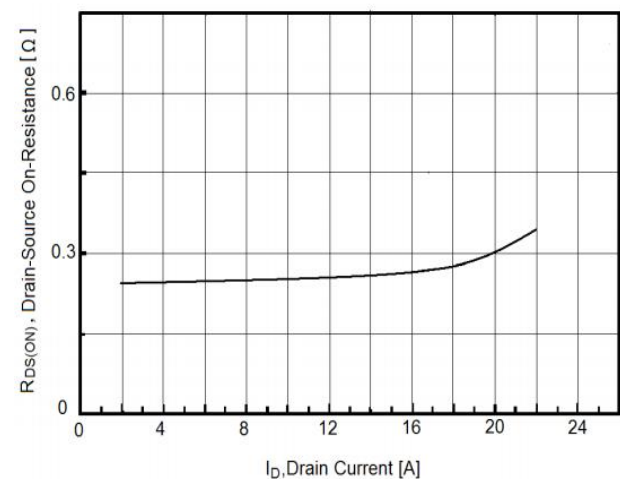


Figure6. Static drain-source on resistance



RATINGS AND CHARACTERISTIC CURVES

Figure7. $R_{DS(ON)}$ vs Junction Temperature

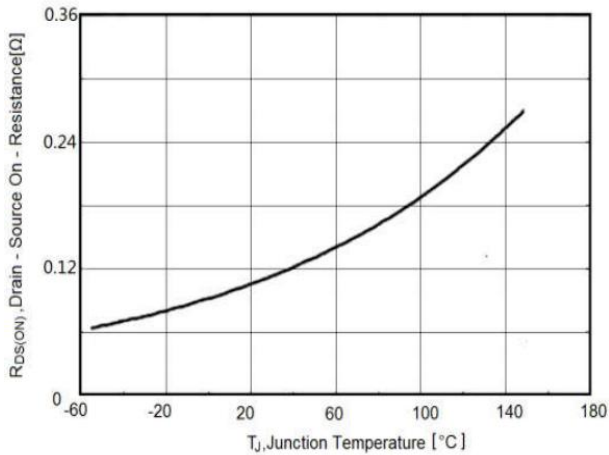


Figure8. BV_{DSS} vs Junction Temperature

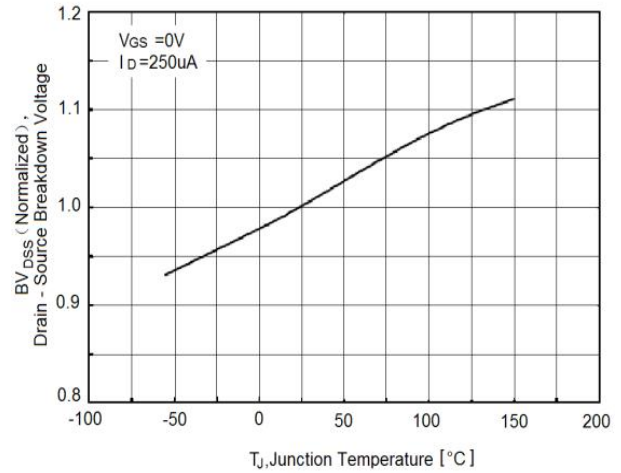


Figure9. Maximum I_D vs Junction Temperature

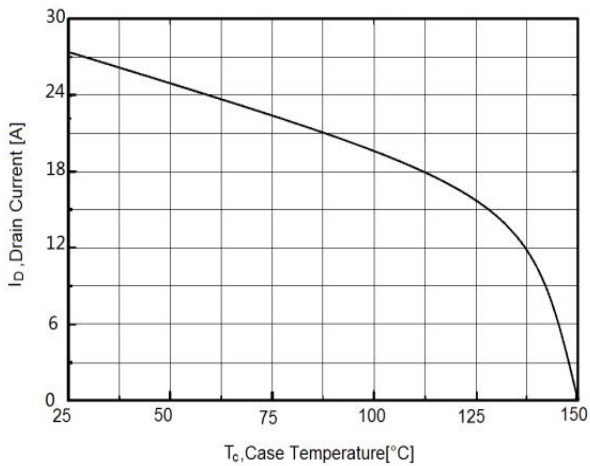


Figure10. Gate charge waveforms

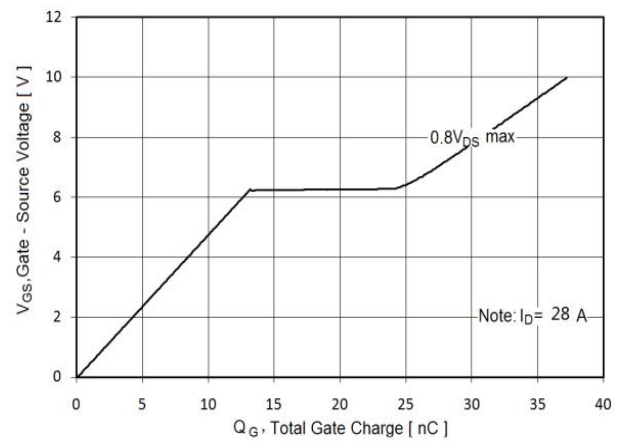


Figure11. Capacitance

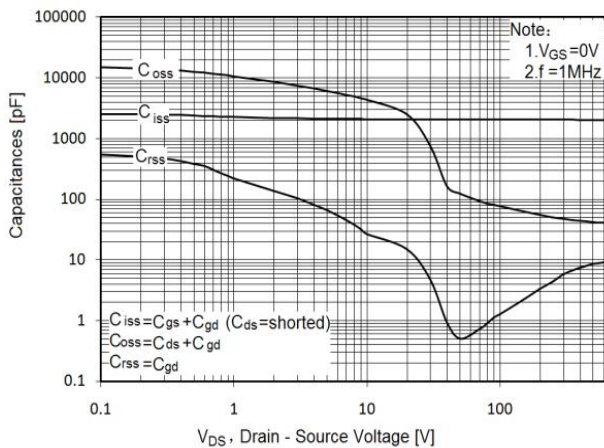
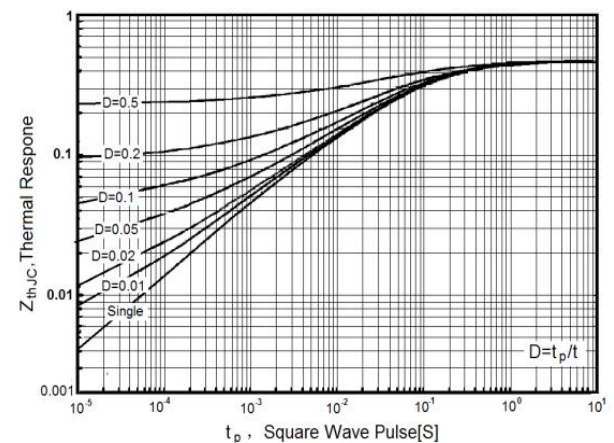
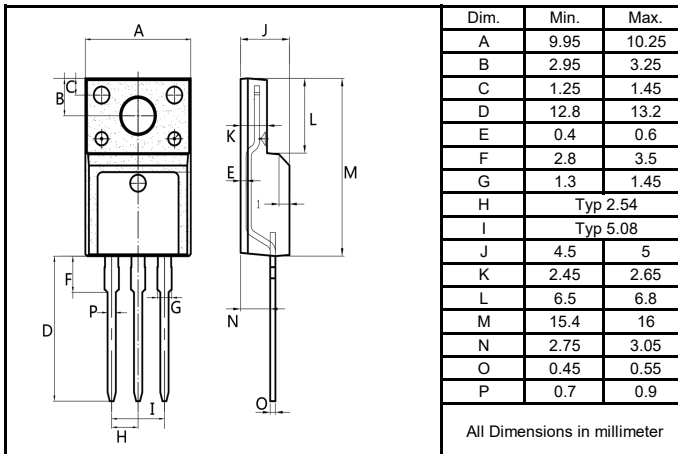


Figure12. Transient Thermal Impedance

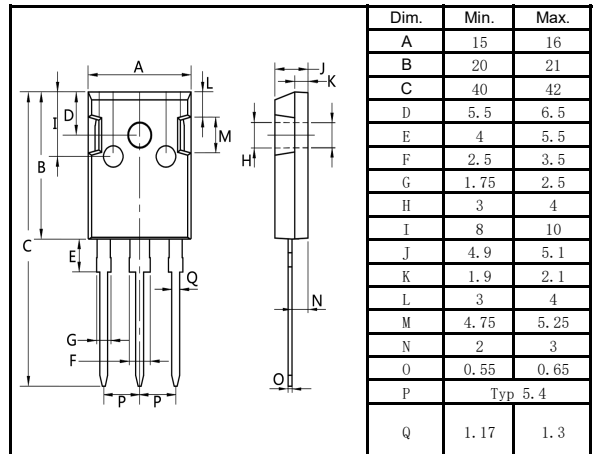


Package Outline Dimensions millimeters

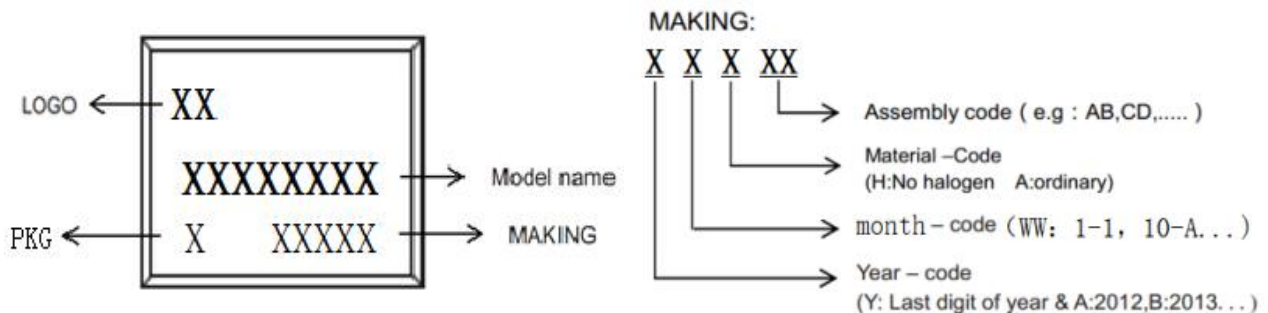
TO-220F



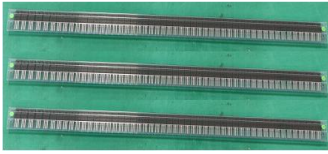
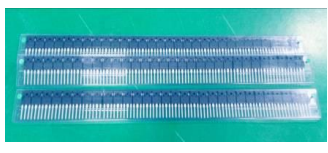
TO-247



Marking on the body



packing instruction

PKG	最小包装	内盒	外箱
TO-220F			
	50pcs/管	1000pcs/盒	5000pcs/箱
TO-247			
	30PCS/管	600pcs/盒	3000pcs/箱

Notice

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

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



CS28N65A

N-Channel Enhancement Mode Power MOSFET

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