

MAIN CHARACTERISTICS

I_D	50A
V_{DS}	500V
$R_{DS(on)-typ}$ (@ $V_{GS}=10V$ $T_c=25^{\circ}C$)	0.08 Ω

FEATURES

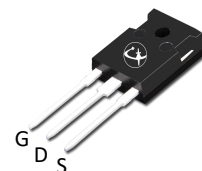
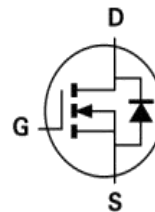
- Fast Switching
- Low ON Resistance
- Low Gate Charge
- 100% Single Pulse avalanche energy Test

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



TO-247

Product specification classification

Part Number	Package	Mode Name	Pack
CS50N50A6	TO-247	CS50N50A	Tube

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
		247	
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Continue Drain Current	I_D	50	A
Pulsed Drain Current (Note1)	I_{DM}	200	A
Power Dissipation	P_D	190	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	3250	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.65	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°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	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	BV_{DSS}	500	-	-	V
Drain-Source Leakage Current	$V_{DS} = 500 \text{ V}, V_{GS} = 0 \text{ V}$	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	$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}$	$R_{DS(on)}$	-	0.08	0.1	Ω
Input Capacitance	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	C_{iss}	-	8405	-	pF
Output Capacitance		C_{oss}	-	597	-	pF
Reverse Transfer Capacitance		C_{rss}	-	218	-	pF
Turn-on Delay Time(Note2)	$I_D = 20 \text{ A}, V_{DD} = 250 \text{ V}, R_G = 10 \Omega$	$t_d(ON)$	-	321	-	ns
Rise Time(Note2)		t_r	-	27	-	ns
Turn-Off Delay Time(Note2)		$t_d(OFF)$	-	210	-	ns
Fall Time(Note2)		t_f	-	46	-	ns
Total Gate Charge(Note2)	$I_D = 20 \text{ A}, V_{DD} = 400 \text{ V}, V_{GS} = 10 \text{ V}$	Q_G	-	412	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	171	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	56	-	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	-	-	50	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	200	A
Drain-Source Diode Forward Voltage	$I_{SD} = 20 \text{ A}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_{SD} = 20 \text{ A}, V_{GS} = 0 \text{ V}, dI_F / dt = 100 \text{ A}/\mu\text{s}$	t_{rr}	-	510	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	6.5	-	μC

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

RATINGS AND CHARACTERISTIC CURVES

Figure.1 Typical Output Characteristics

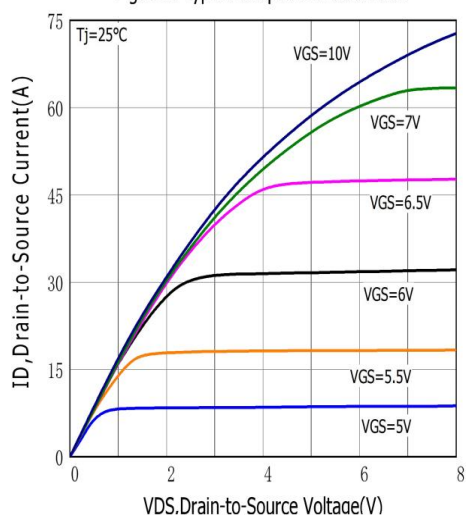


Figure.2 Typical Gate Charge vs Gate to Source Voltage

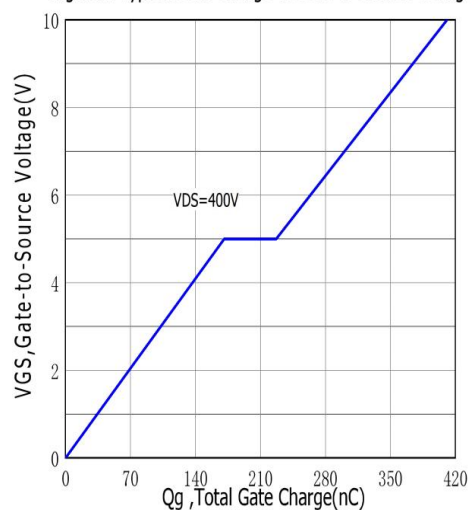


Figure.3 Typical Body Diode Transfer Characteristics

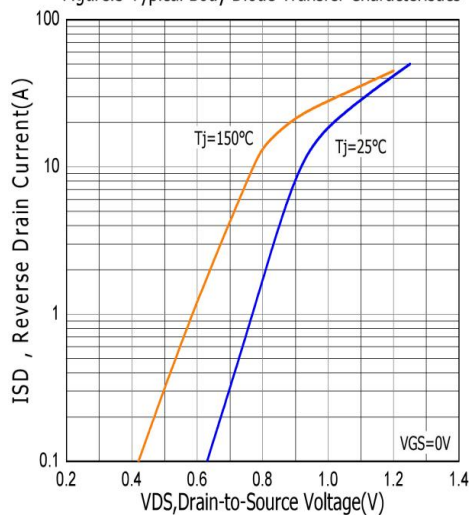


Figure.4 Typical Capacitance vs Drain to Source Voltage

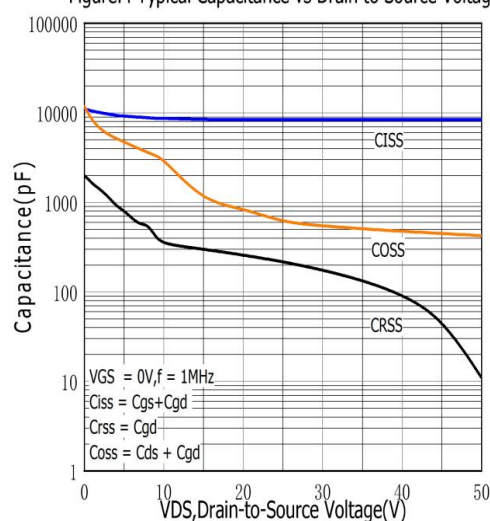


Figure.5 Typical Breakdown Voltage vs Junction Temperature

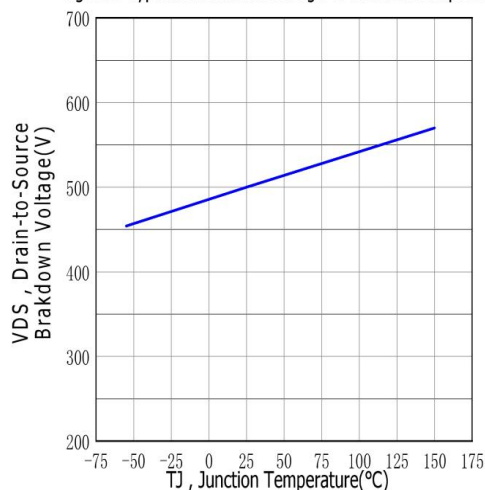
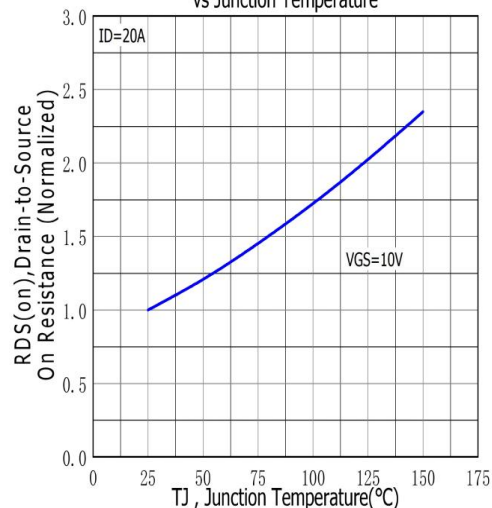


Figure.6 Typical Drain to Source on Resistance vs Junction Temperature



RATINGS AND CHARACTERISTIC CURVES

Figure.7 Maximum Forward Bias Safe Operating Area

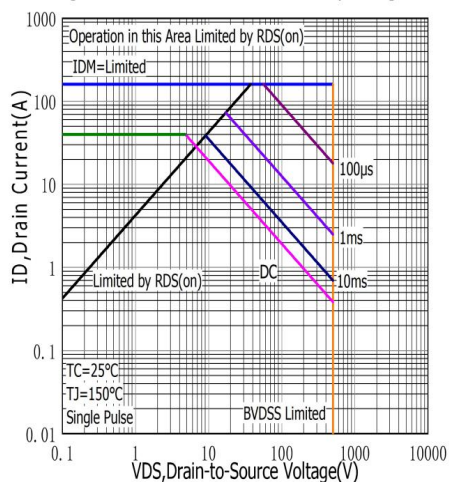


Figure.8 Typical Drain to Source ON Resistance vs Drain Current

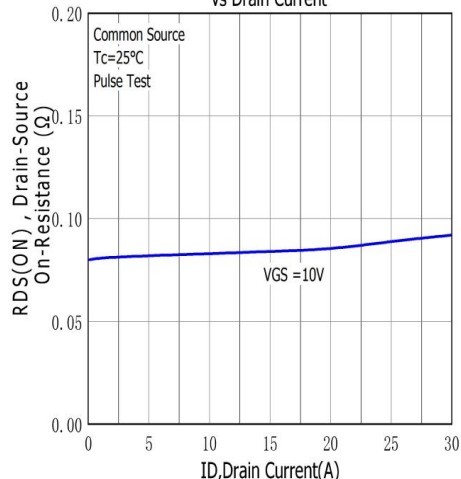


Figure.9 Maximum EAS vs Channel Temperature

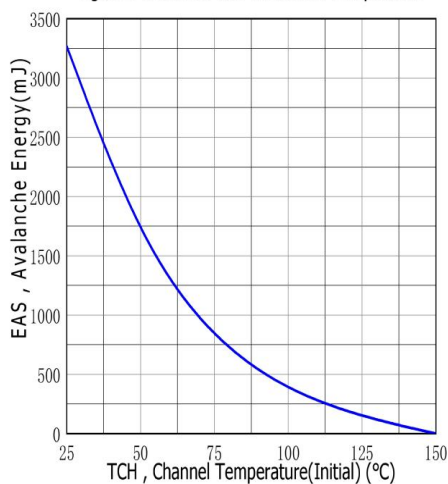


Figure.10 Typical Threshold Voltage vs Case Temperature

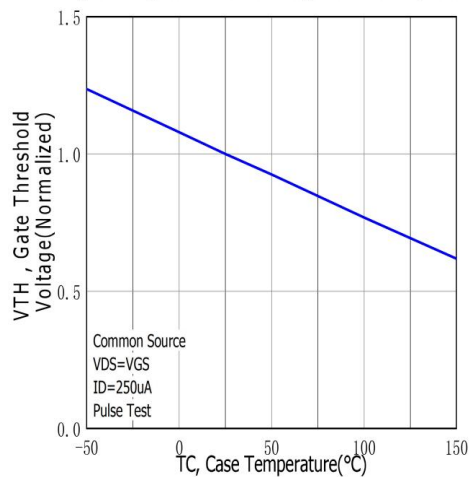


Figure.11 Maximum Effective Thermal Impedance, Junction to Case

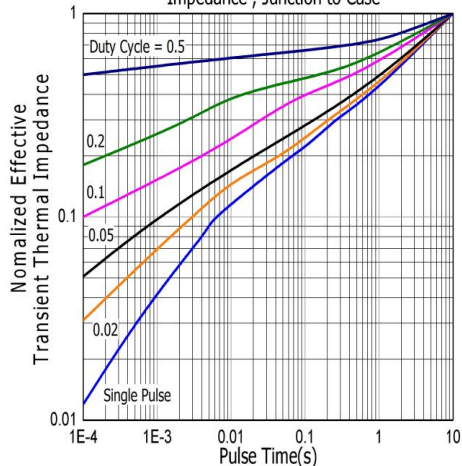
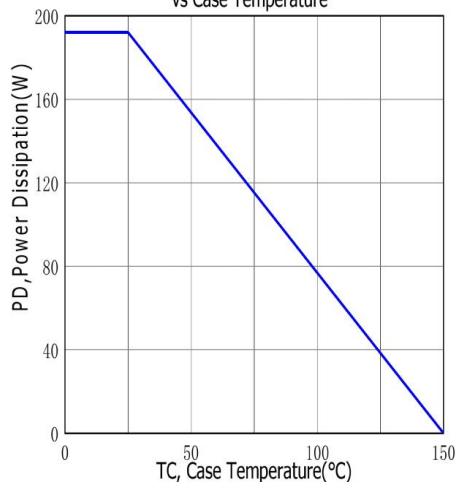
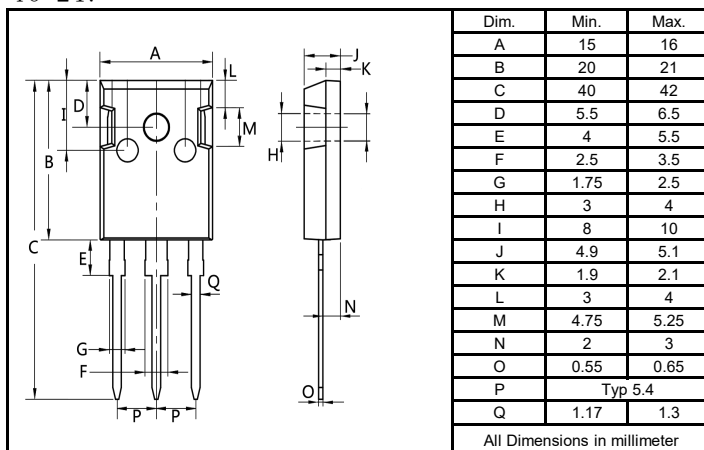


Figure.12 Maximum Power Dissipation vs Case Temperature

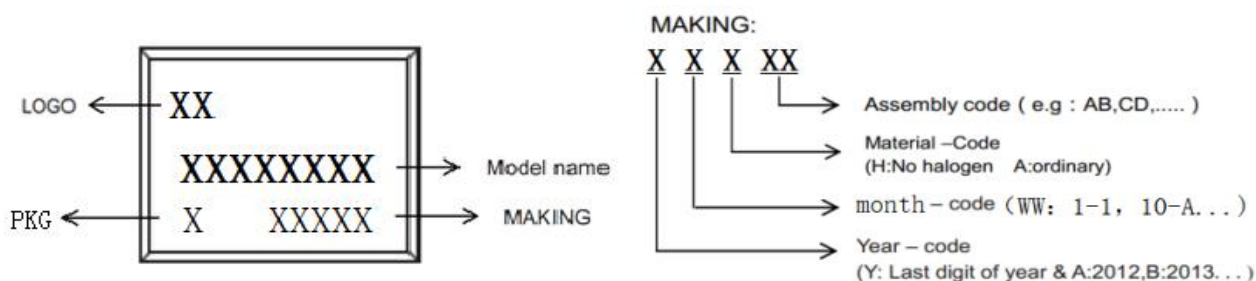


Package Outline Dimensions millimeters

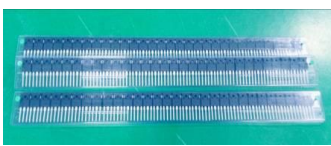
TO-247



Marking on the body



packing instruction

PKG	Minimal Package	Mini Box	Box
TO-247			
	30pcs/pdpe	600pcs/box	3000pcs/box



CS50N50A

N-Channel Enhancement Mode Power MOSFET

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.

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Revision History

Rev	Changes	Date
1.0	First version	2025-7-21