



## FXN28N50T Series

Rev.A

### General Description

The FXN28N50T uses advanced Silicon's MOSFET Technology, which provides high performance in on-state resistance, fast switching performance, and excellent quality.

These devices can also be utilized in industrial applications such as Low Power Drives SMPS, DC/DC converter, and general purpose applications.

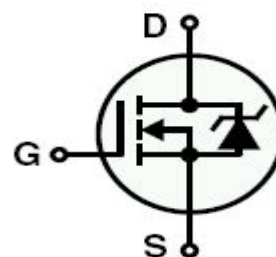
### Features

- $V_{DS} = 500V$
- $ID = 28A @ V_{GS} = 10V$
- Very low on-resistance
- $R_{DS(ON)} < 0.2\Omega @ V_{GS} = 10V$
- 100% UIL Tested
- 100% Rg Tested
- 150 °C operating temperature



TO-247 Top View

### N-channel



Schematic Diagram

### Absolute Maximum Ratings (T<sub>J</sub> =25°C)

Characteristics		Symbol	Rating	Unit
Drain-Source Voltage		VDSS	500	V
Gate-Source Voltage		VGSS	±30	V
Continuous Drain Current (1)	Tc=25°C(silicon limited)	ID	28	A
	Tc=25°C(package limited)		23	
	Tc=100°C(silicon limited)		16.7	
Pulsed Drain Current (2)		IDM	112	
Power Dissipation	Tc=25°C	PD	108	W
	Tc=100°C		105	
Single Pulse Avalanche Energy (3)		EAS	3020	mJ
Junction and Storage Temperature Range		TJ, Tstg	-55~175	°C

### Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient (1)	RθJA	100	°C/W
Thermal Resistance, Junction-to-Case	RθJC	1.16	



## Electrical Characteristics (T<sub>J</sub> = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BVDSS	ID = 250μA, VGS = 0V	500	540	-	V
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	2	3	4	
Drain Cut-Off Current	IDSS	VDS = 500V, VGS = 0V	-	-	1	μA
Gate Leakage Current	IGSS	VGS = ±30V, VDS = 0V	-	-	±0.1	
Drain-Source ON Resistance	RDS(ON)	VGS = 10V, ID = 14A	-	0.17	0.20	Ω
Forward Transconductance	gfs	VDS = 25V, ID = 14A	-	30	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Qg	VDS = 400V, ID = 28A, VGS = 10V	-	80	-	nC
Gate-Source Charge	Qgs		-	22	-	
Gate-Drain Charge	Qgd		-	19.2	-	
Input Capacitance	Ciss	VDS = 300V, VGS = 0V, f = 1.0MHz	-	4.2	-	nF
Reverse Transfer Capacitance	Crss		-	0.18	-	
Output Capacitance	Coss		-	1.42	-	
Turn-On Delay Time	td(on)	VGS = 10V, VDS = 300V, ID = 28A, RG = 25Ω	-	25	-	ns
Rise Time	tr		-	38	-	
Turn-Off Delay Time	td(off)		-	96	-	
Fall Time	tf		-	35	-	
Gate Resistance	Rg	f=1 MHz	-	-	-	Ω
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	VSD	IS = 28A, VGS = 0V	-	1.0	1.5	V
Body Diode Reverse Recovery Time	trr	IF = 28A, dI/dt = 100A/μs	-	538	-	ns
Body Diode Reverse Recovery Charge	Qrr		-	4.2	-	μC

### Note

- Surface mounted FR-4 board by JEDEC (jesd51-7)
- Pulse width limited by T<sub>Jmax</sub>
- EAS is tested at starting T<sub>J</sub> = 25°C, L = 10.5mH, I<sub>AS</sub> = 28A, V<sub>GS</sub> = 10V VDD=50V



### Typical Characteristics (T<sub>j</sub>=25°C Noted)

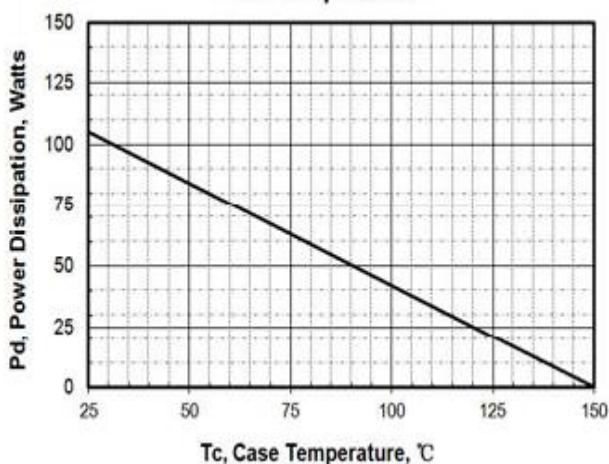


Figure 1. MAX. Power Dissipation VS Case Temperature

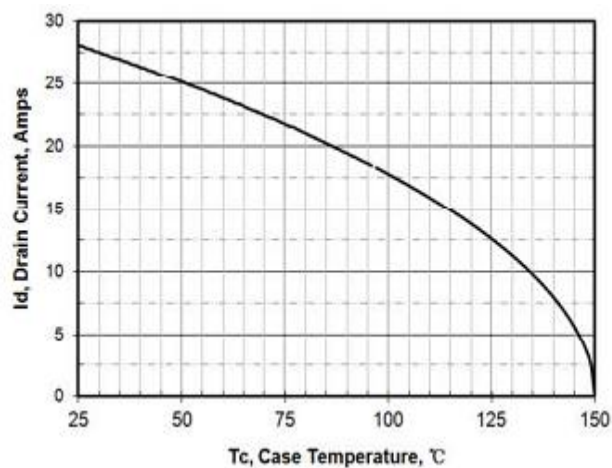


Figure 2. Maximum Continuous Drain Current vs T<sub>c</sub>

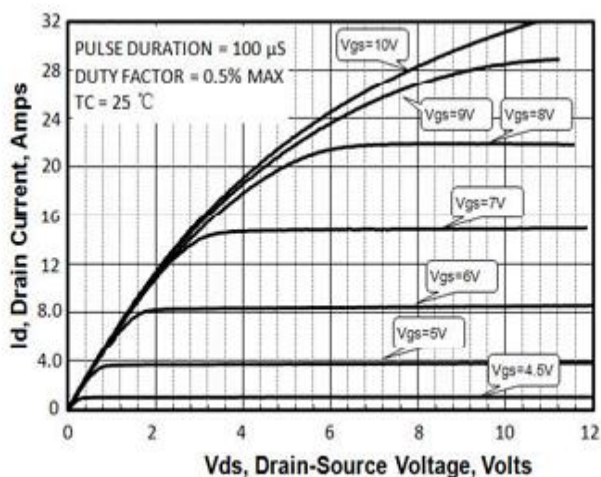


Figure 3. Output Characteristics

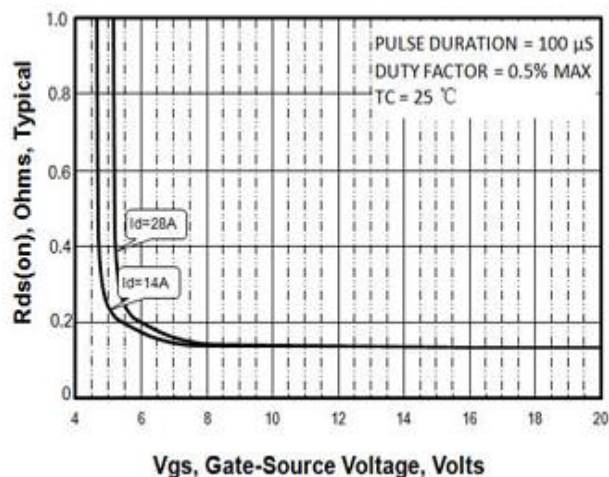


Figure 4. R<sub>ds(on)</sub> VS Gate Voltage

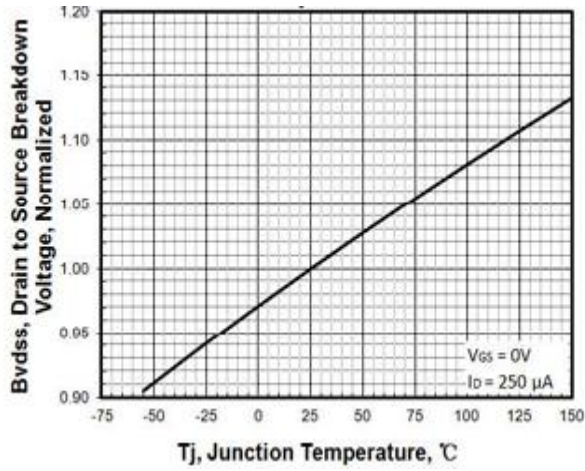


Figure 5. Breakdown Voltage VS Temperature

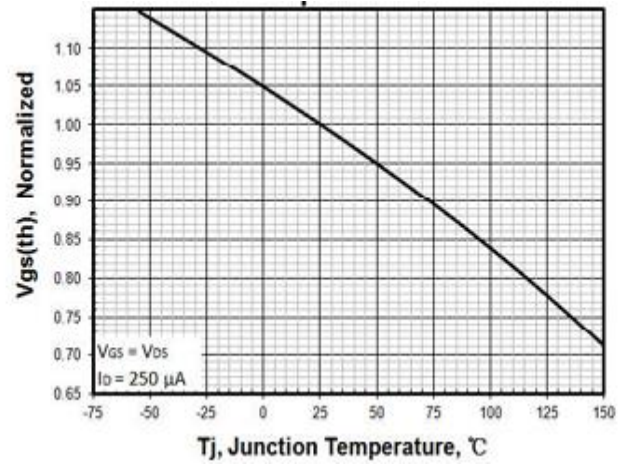


Figure 6. Threshold Voltage VS Temperature

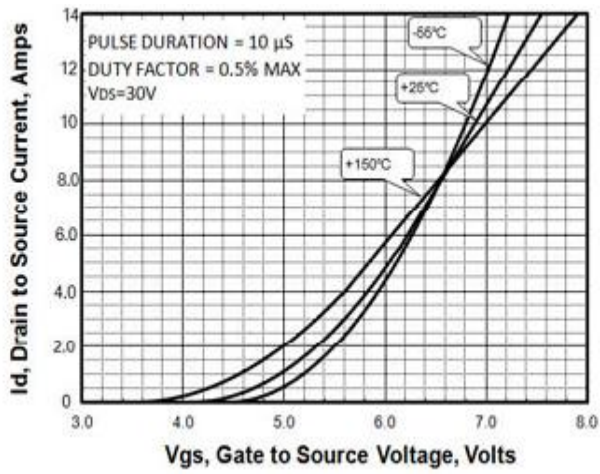


Figure 7. Transfer Characteristics

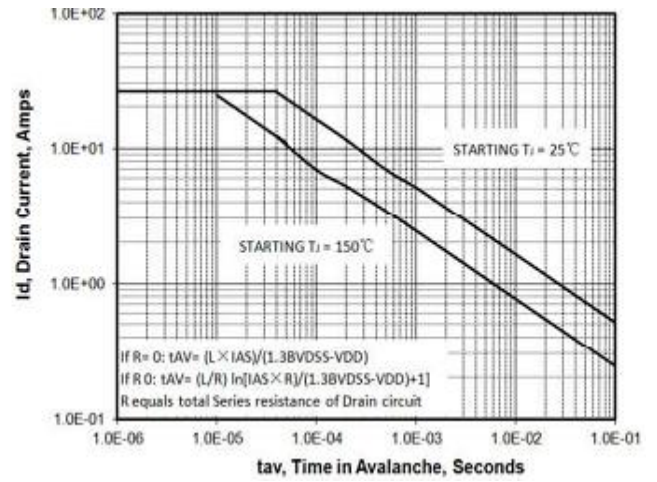


Figure 8. Unclamped Inductive Switching Capability

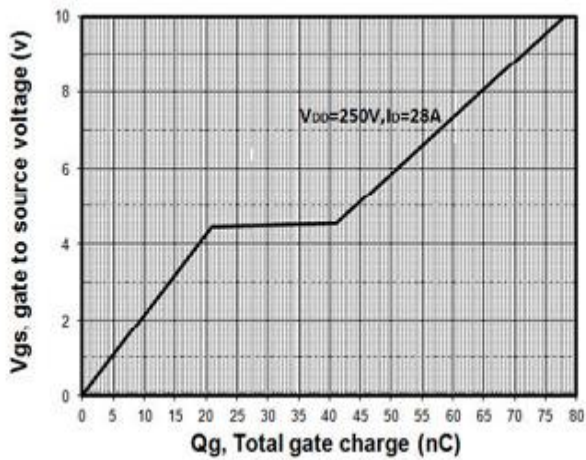


Figure 9. Typical Gate Charge

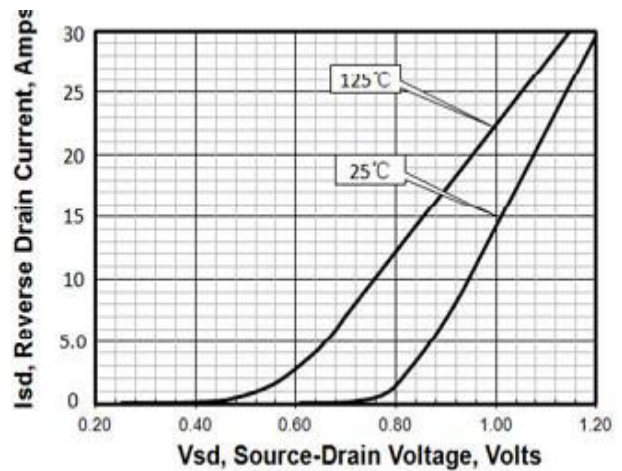


Figure 10. Body Diode Transfer characteristics

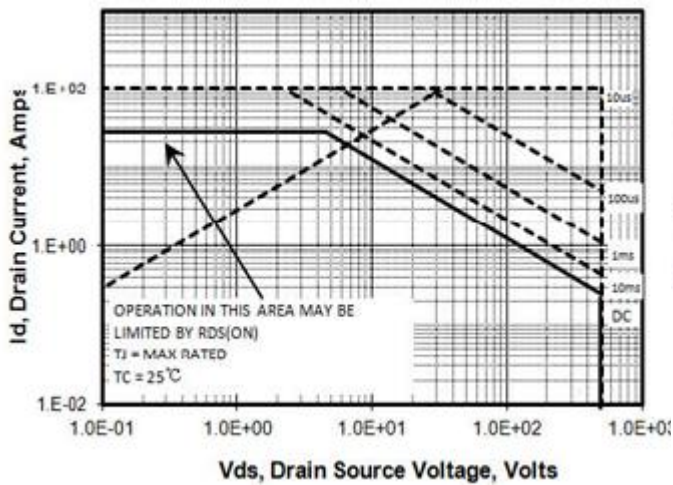


Figure 11. Maximum safe Operating Area

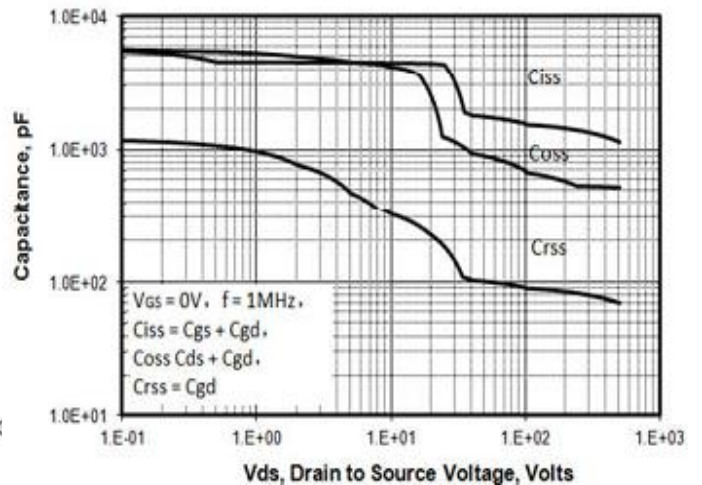
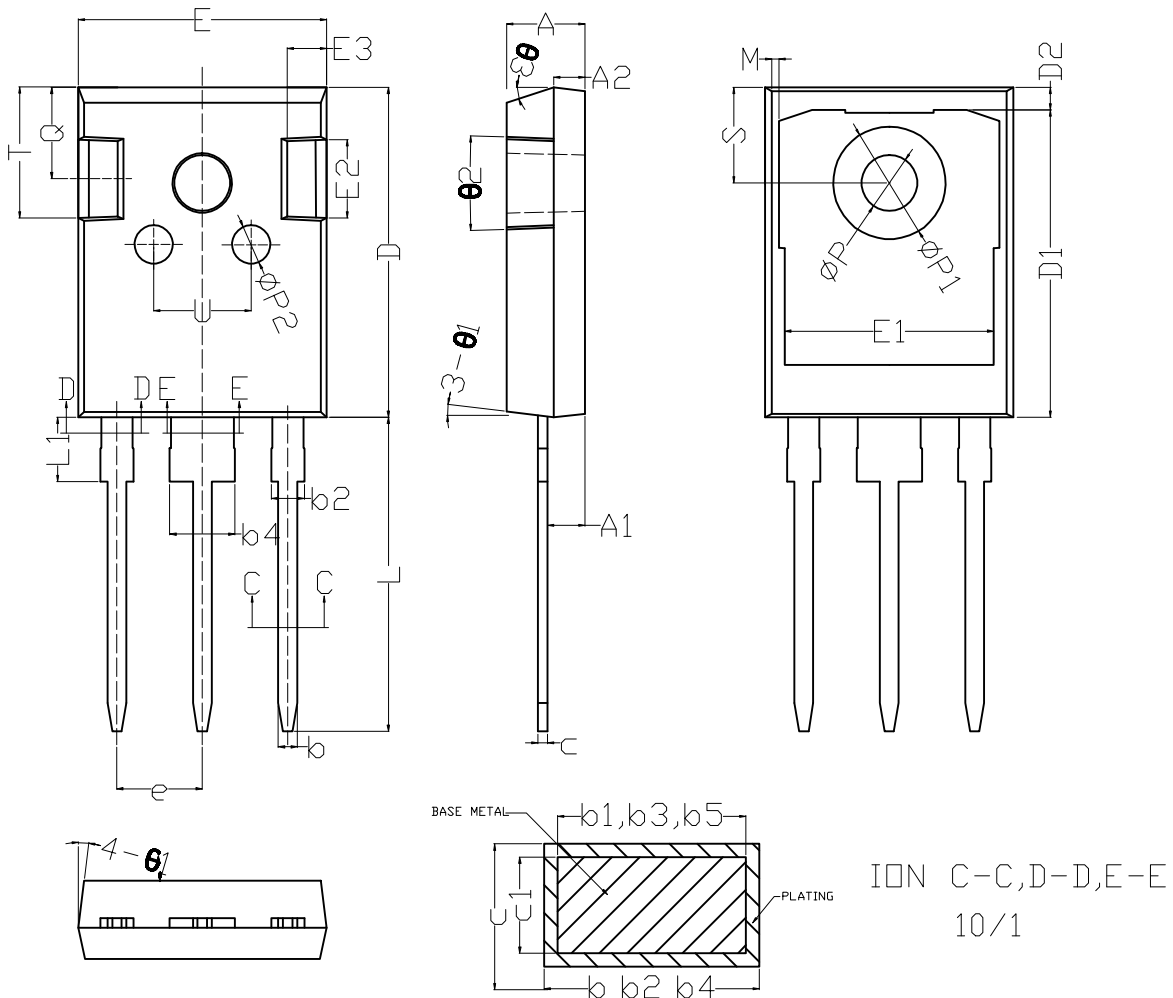


Figure 12. Capacitance VS Vds



## TO-247 Package Information



### COMMON DIMENSIONS

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
b	1.16	1.21	1.26
b1	1.15	1.20	1.25
b2	1.95	2.10	2.15
b3	1.94	2.09	2.14
b4	3.10	3.15	3.20
b5	3.09	3.14	3.19
c	0.59	0.61	0.66
c1	0.58	0.60	0.65
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	5.44BSC		
L	19.80	19.92	20.10
L1	-	-	4.30
M	0.35	0.50	0.75
ØP	3.50	3.60	3.70
ØP1	7.00	7.20	7.40
ØP2	2.40	2.50	2.60
Q	5.60	5.80	6.00
S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	-	6.40
Ø1	5*	7*	9*
Ø2	3*	5*	8*
Ø3	13*	16*	19*