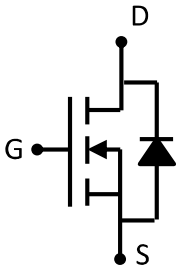
Feature

- 500V,3A
  $R_{DS(ON)}$ <3.0Ω @V_{GS}=10V TYP:2.6Ω
- Fast Switching
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic diagram

Application

- PWM applications
- Load Switch
- Power management

TO-220F

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
3N50F	AP3N50F	TO-220F	-	-	1000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current (T_a =25℃)	I_D	3	A
Continuous Drain Current (T_a =100℃)	I_D	1.8	A
Pulsed Drain Current (1)	I_{DM}	12	A
Single Pulsed Avalanche Energy (2)	E_{AS}	45	mJ
Power Dissipation	P_D	25	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	4.9	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	500	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =500V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±30V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	3.1	4	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =1.5A	-	2.6	3.0	Ω
Forward tranconductance(3)	g_{FS}	V_{DS} =10V, I_D =1.5A	0.5	-	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz	-	278	-	pF
Output Capacitance	C_{oss}		-	20	-	
Reverse Transfer Capacitance	C_{rss}		-	5	-	
Switching characteristics						
Turn-off delay time	$t_{d(off)}$	V_{DD}=300V, I_D=3A,V_{GS}=10V, R_G=25Ω	-	13	-	ns
Total Gate Charge	Qg	VDS=480V, ID=1A, VGS=10V	-	4.8	-	nC
Gate-Source Charge	Qgs		-	0.7	-	
Gate-Drain Charge	Qgd		-	2.7	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=3A	-	-	1.4	V
Diode Forward current(4)	I_S		-	-	3	A
Body Diode Reverse Recovery Time	trr	T_J=25°， IF=3A,di/dt=100A/us		190		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25°， IF=3A,di/dt=100A/us		0.53		uc

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=50V,R_G=2.0Ω,L=10mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Typical Characteristics

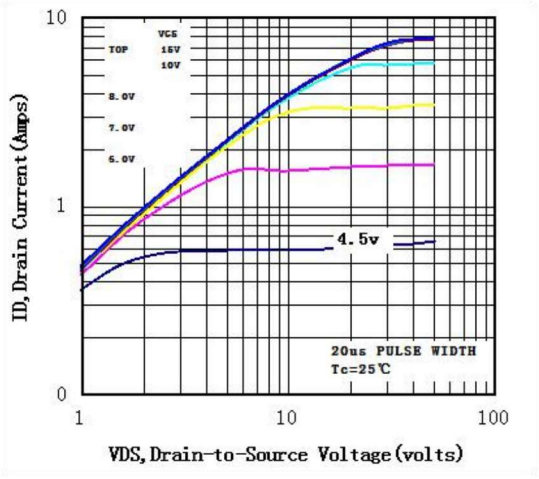


Fig1 Typical Output Characteristics, Tc=25℃

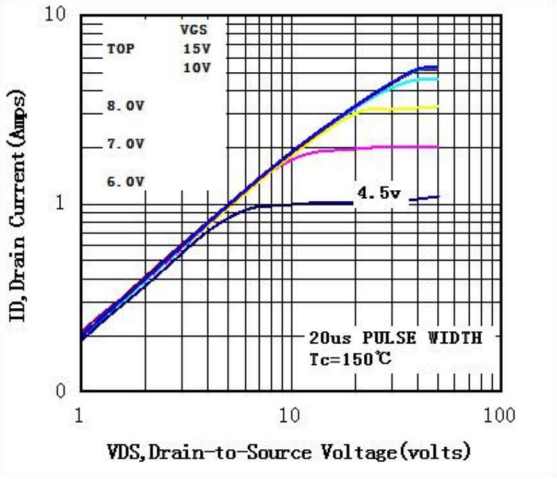


Fig2 Typical Output Characteristics, Tc=150℃

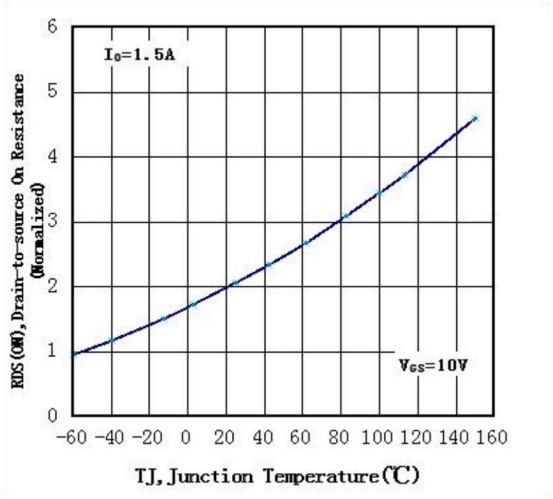


Fig3 Normalized On-Resistance Vs.Temperature

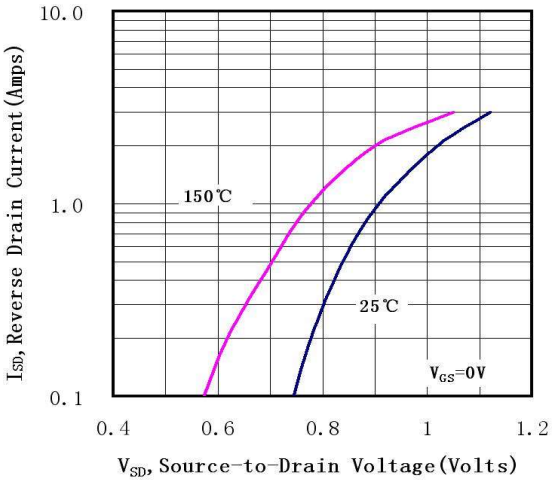


Fig4 Typical Source-Drain Diode Forward Voltage

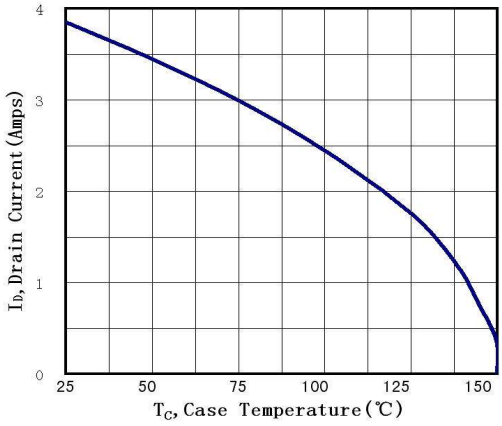


Fig5 Maximum Drain Current Vs.Case Temperature

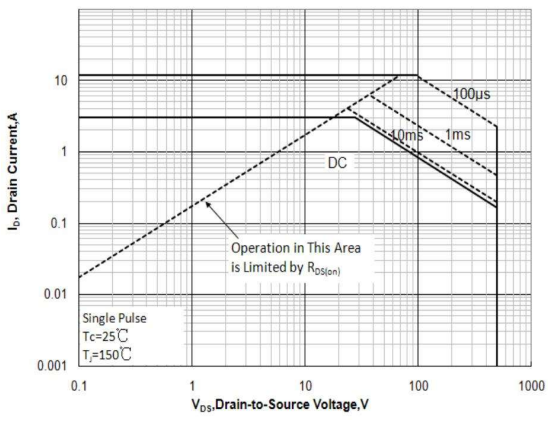
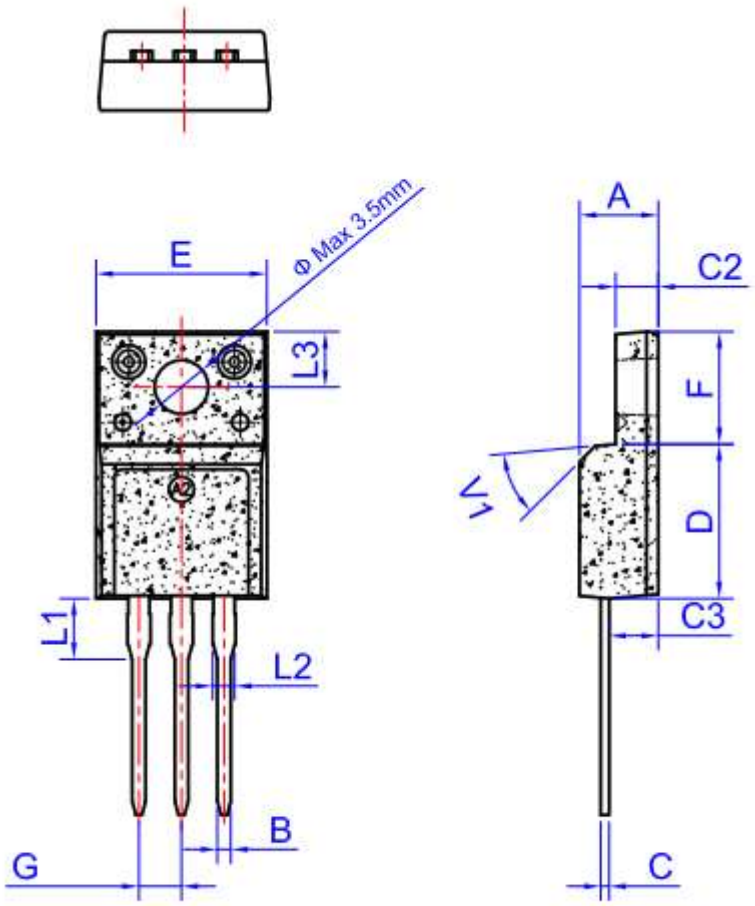


Fig6 Maximum Safe Operating Area

Package Outlines



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

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