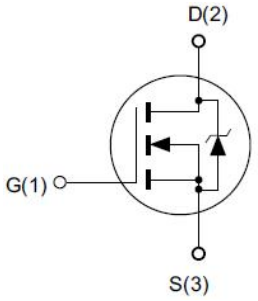
MPF04NA2

N-Channel Power MOSFET

Features

- ◆ 1200V, 4A, $R_{DS(ON)}$(Typ.) = 2.9Ω@VGS = 10V.
- ◆ Low ON Resistance
- ◆ Fast Switching
- ◆ Low Gate Charge
- ◆ 100% Single Pulse avalanche energy Test

TO-220F



Application

- ◆ UPS
- ◆ High efficiency switch mode power supplies
- ◆ Electronic lamp ballasts based on half bridge

Absolute Maximum Ratings T_C = 25° C unless otherwise noted

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage [a]	1200	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, T_C =25°C	4	A
	Drain Current-Continuous, T_C =100°C	2.4	A
I_{DM}	Drain Current-Pulsed [b]	16	A
P_D	Maximum Power Dissipation @ T_J =25°C	48	W
EAS	Single Pulsed Avalanche Energy [d]	80	mJ
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max.	2.6	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max.	62.5	°C/W

Electrical Characteristics T_J = 25° C unless otherwise noted

■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	1200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 1200V V_{GS} = 0V	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	V_{DS} = 0V, V_{GS} = ±30V	-	-	±100	nA

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_{GS}(th)	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D =250μA	3	-	5	V
R_{DS}(on)	Static Drain-Source On-Resistance [c]	V_{GS} = 10V, I_D =2A	-	2.9	4	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	833	-	pF
Coss	Output Capacitance		-	150	-	pF
Crss	Reverse Transfer Capacitance		-	98	-	pF

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 600V, I_D =4A, R_G = 25Ω,V_{GS} = 10V	-	29	-	ns
t_r	Turn-On Rise Time		-	55	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	94	-	ns
t_f	Turn-Off Fall Time		-	88	-	ns
Qg	Total Gate Charge	V_{DD} = 960V, I_D =4A, V_{GS} = 10V	-	39		nC
Qgs	Gate-Source Charge		-	6	-	nC
Qgd	Gate-Drain Charge		-	25	-	nC

Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	V_{GS} = 0V	-	-	4	A
I_{SM}	Maximum Pulsed Current	V_{GS} = 0V	-	-	16	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 4	-	-	1.5	V
trr	Reverse Recovery Time	I_S=4A,T_j = 25℃ dIF/dt=100A/us, V_{GS}=0V	-	595	-	ns
Qrr	Reverse Recovery Charge		-	4.9	-	uC

Notes:

a. TJ=+25 ℃ to +150 ℃

b. Repetitive rating; pulse width limited by maximum junction temperature.

c. Pulse width≦300us; duty cycle≦2%

d. L=10mH, VDD=50V,Ias=4A,RG=25Ω Starting TJ=25 ℃

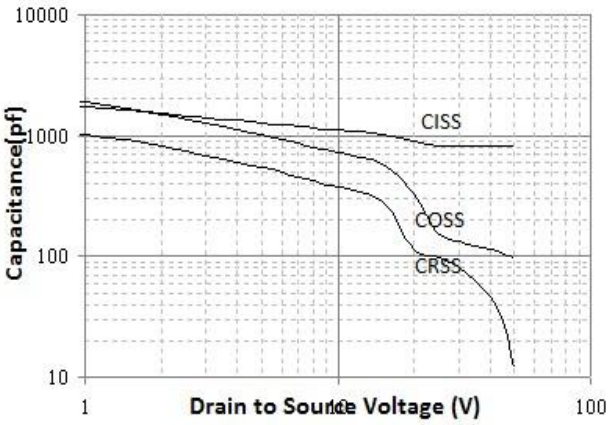


Figure 1. Capacitance Characteristics

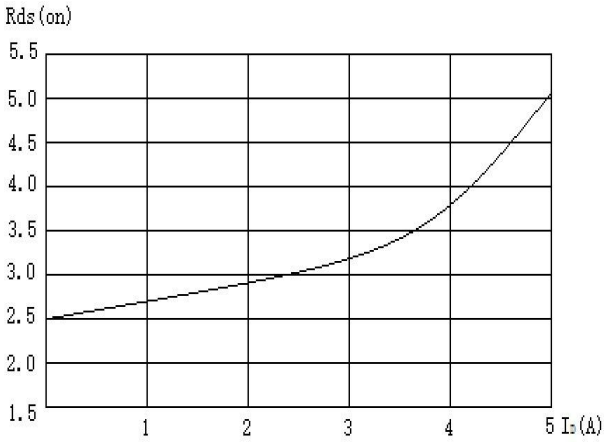


Figure 2. On-Resistance Variationvs. ID

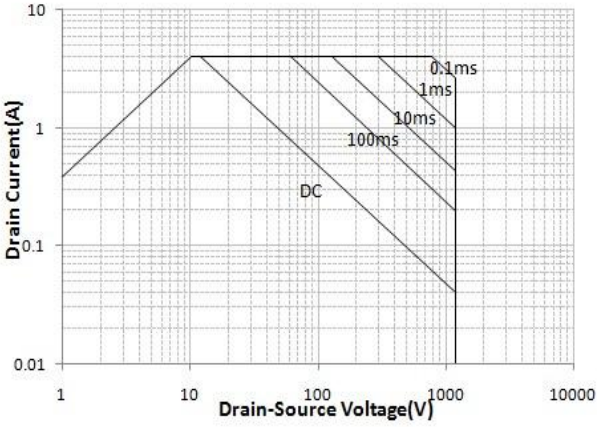


Figure 3. Maximum Safe Operating Area

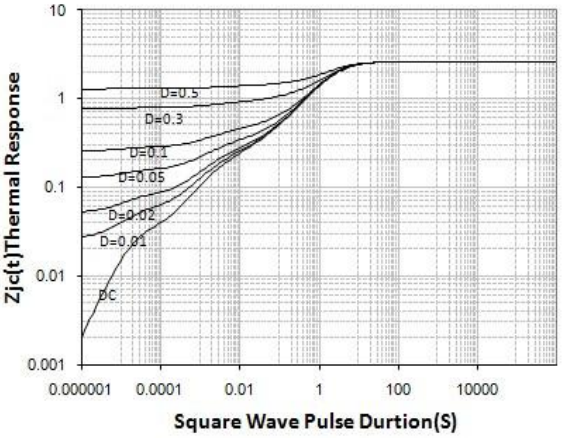


Figure 4.Thermal impedance

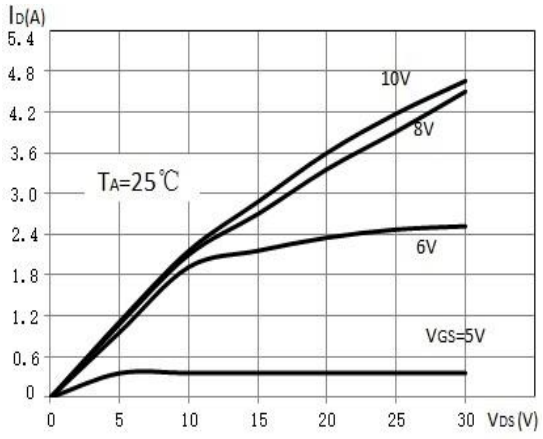


Figure 5.Output characteristics

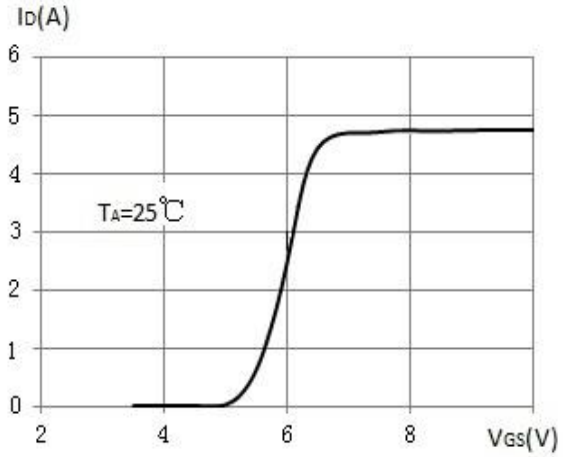


Figure 6. Transfer characteristics

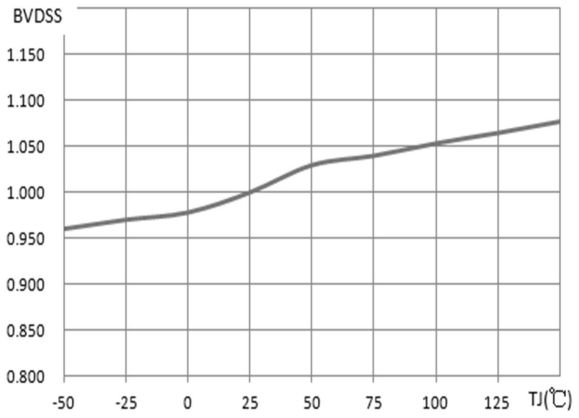


Figure 7.Normalized BVDSS vs. temperature

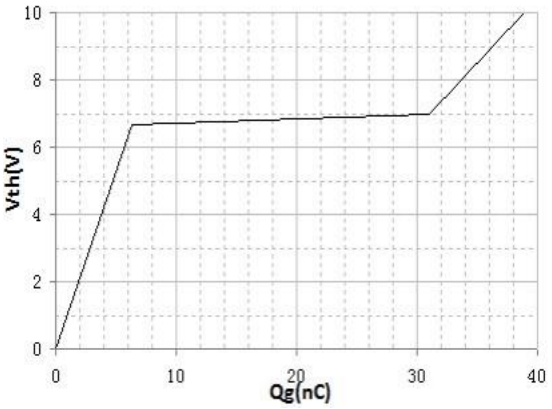


Figure 8.Gate charge vs. VGS

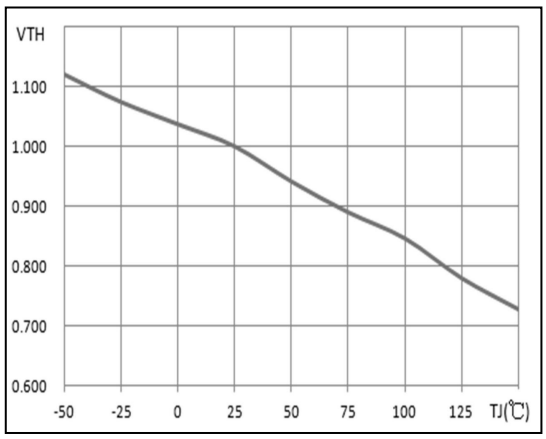


Figure 9.Normalized VTH vs. temperature

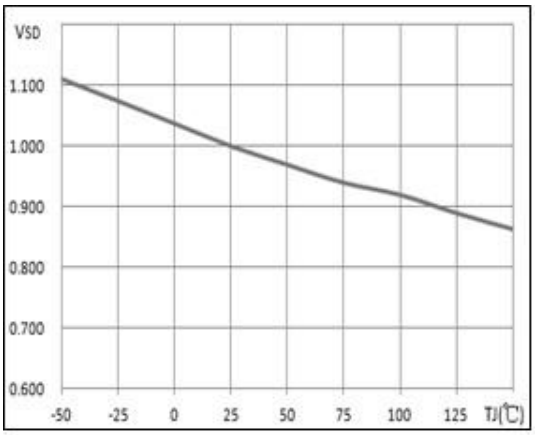


Figure 10.Normalized VSD vs. temperature

■ Package Information