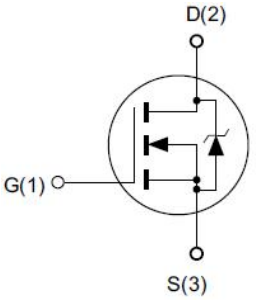
MPF16N65

N-Channel Power MOSFET

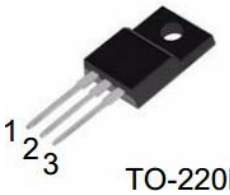
Features

- ◆ 650V, 16A, $R_{DS(ON)}$(Max.) = 0.55Ω@VGS = 10V.
- ◆ Low Crss
- ◆ Fast Switching
- ◆ 100% Avalanche Tested



Application

- ◆ Adapter
- ◆ Standby Power
- ◆ Switching Mode Power Supply



TO-220F

Absolute Maximum Ratings T_C = 25° C unless otherwise noted

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage [a]	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, T_C =25°C	16	A
	Drain Current-Continuous, T_C =100°C	10.6	A
I_{DM}	Drain Current-Pulsed [b]	64	A
P_D	Maximum Power Dissipation @ T_J =25°C	70	W
EAS	Single Pulsed Avalanche Energy [d]	605	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.	1.79	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max	100	°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	650	-	-	
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, 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	2	-	4	V
$R_{DS}(on)$	Static Drain-Source On-Resistance [c]	V_{GS} = 10V, I_D =8.0A	-	0.45	0.55	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
g_{fs}	Forward Transconductance[d]	V_{DS} = 15V,I_D =8.0A		15		S
Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	2430	-	pF
Coss	Output Capacitance		-	215	-	pF
Crss	Reverse Transfer Capacitance		-	18	-	pF

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 325V, I_D =16A, R_G = 25Ω,V_{GS}=10V	-	28	-	ns
t_r	Turn-On Rise Time		-	68	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	142	-	ns
t_f	Turn-Off Fall Time		-	73	-	ns
Qg	Total Gate Charge	V_{DS} = 325V, I_D =16A, V_{GS} = 10V	-	53		nC
Qgs	Gate-Source Charge		-	11	-	nC
Qgd	Gate-Drain Charge		-	23	-	nC

Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	V_{GS} = 0V	-	-	16	A
I_{SM}	Maximum Pulsed Current	V_{GS} = 0V	-	-	64	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 16A	-	0.9	1.4	V

Notes:

a. T_J=-55 ℃ to +150 ℃

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

c. Pulse width≦300us; duty cycle≦2%

d. L=10mH, V_{DD}=50V,I_{as}=11.0A,RG=25Ω Starting TJ=25 ℃

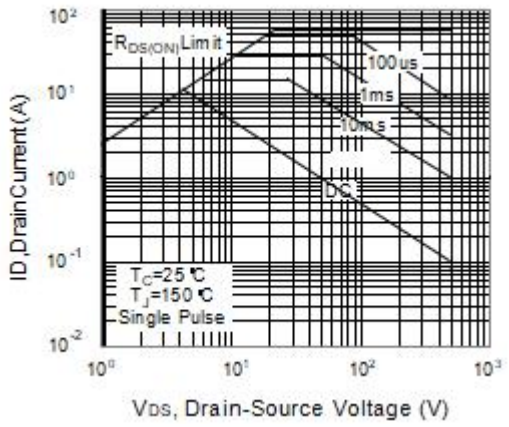


Figure 1 Maximum Safe Operating Area

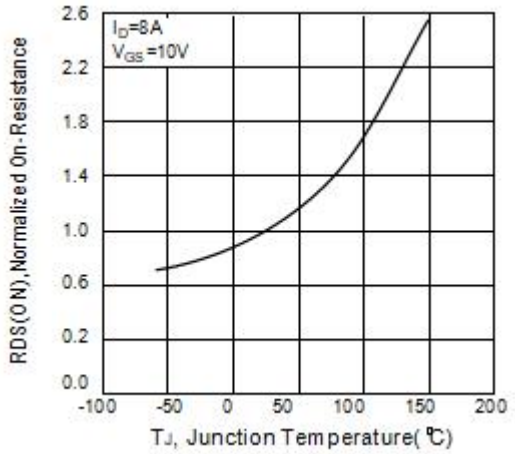


Figure 2 Normalized On-Resistance Variation with Temperature

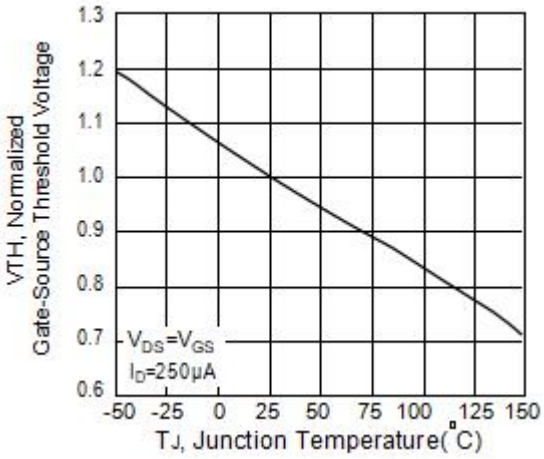


Figure 3. Typical Theshold Voltage vs Junction Temperature

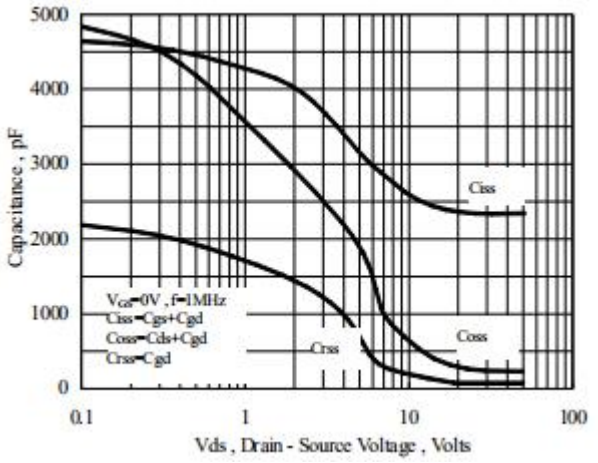


Figure 4. Capacitance Characteristics

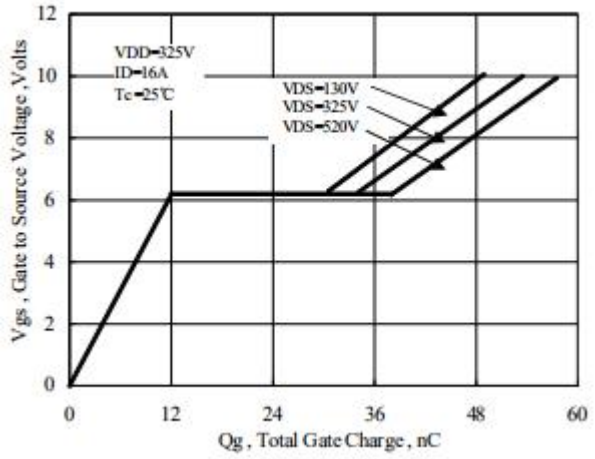


Figure 5. Gate Charge Characteristics

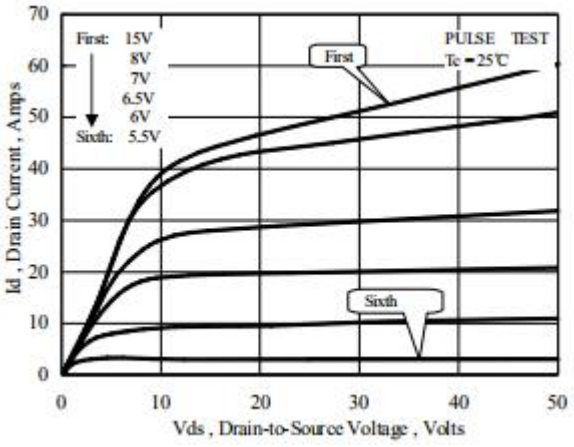


Figure 6. On-State Characteristics

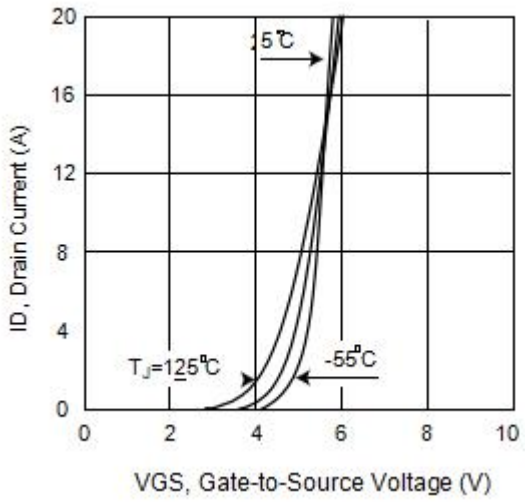


Figure 7. Typical Body Diode Transfer Characteristics

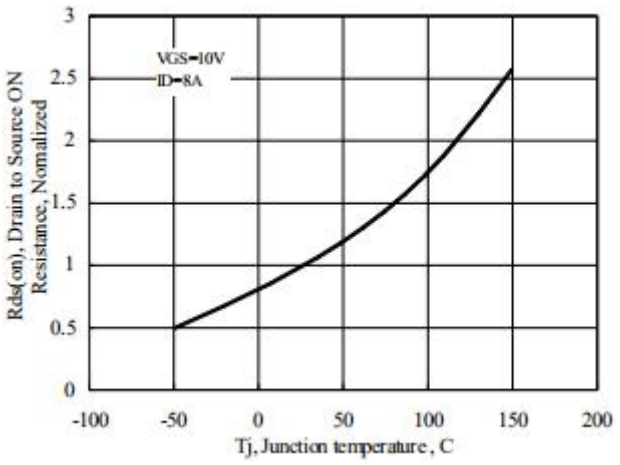


Figure 8. Typical Breakdown Voltage vs Junction Temperature

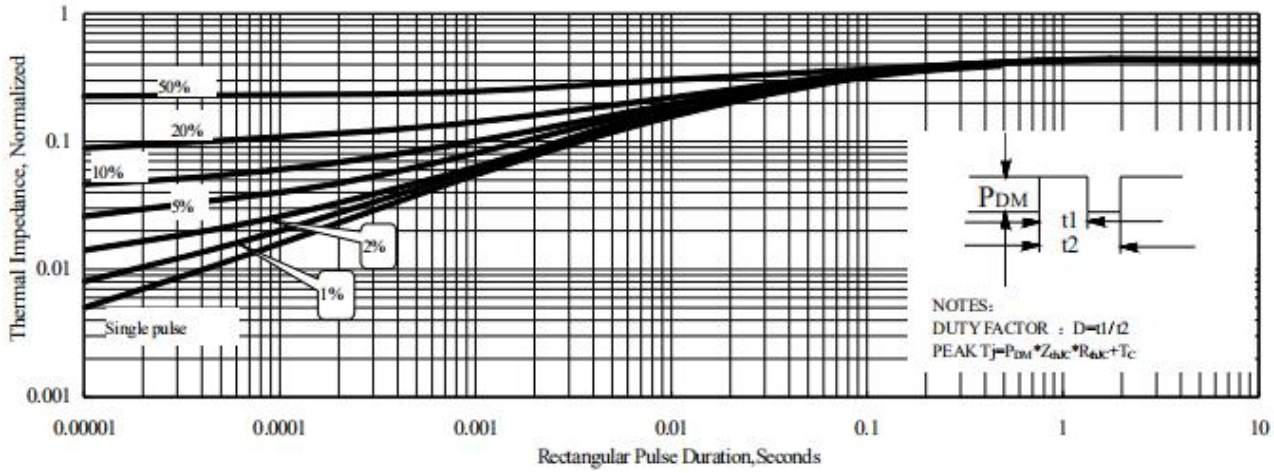


Figure 9. Normalized Effective Transient Thermal Impedance With Pulse Duration(TO-220F)

■ Package Information