



MPF16N60

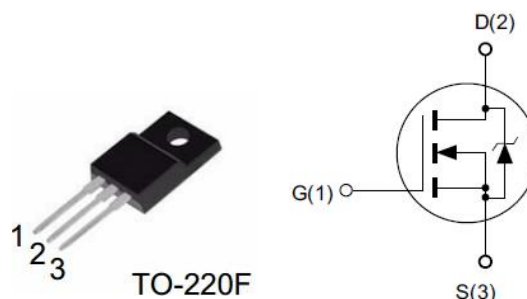
N-Channel Power MOSFET

Features

- ◆ 600V, 16A, $R_{DS(ON)}(Typ.) = 0.39\Omega @ V_{GS} = 10V$.
- ◆ Low C_{rss}
- ◆ Fast Switching
- ◆ 100% Avalanche Tested

Application

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



Absolute Maximum Ratings $T_c = 25^\circ C$ unless otherwise noted.

Symbol	Parameter	Limit	Unit
		TO-220F	
V_{DS}	Drain-Source Voltage ^a	600	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, $T_c = 25^\circ C$	16	A
	Drain Current-Continuous, $T_c = 100^\circ C$	11.5	A
I_{DM}	Drain Current-Pulsed ^b	64	A
P_D	Maximum Power Dissipation @ $T_J = 25^\circ C$	70	W
EAS	Single Pulsed Avalanche Energy ^d	720	mJ
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max.	1.79	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max	62.5	$^\circ C/W$

Electrical Characteristics $T_J = 25^\circ C$ unless otherwise noted.

Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	600	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 600V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 30V$	-	-	± 100	nA



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On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^c	$V_{GS} = 10V, I_D = 8.0A$	-	0.39	0.50	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS} = 25V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	-	2420	-	pF
C_{oss}	Output Capacitance		-	216	-	pF
C_{rss}	Reverse Transfer Capacitance		-	18	-	pF

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 300V, I_D = 16A,$ $R_G = 10\Omega, V_{GS} = 10V$	-	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
Q_g	Total Gate Charge	$V_{DS} = 300V, I_D = 16A,$ $V_{GS} = 10V$	-	53.2	-	nC
Q_{gs}	Gate-Source Charge		-	13.2	-	nC
Q_{gd}	Gate-Drain Charge		-	18.9	-	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	$V_{GS} = 0V, I_S = 16A$	-	-	1.4	V
T_{rr}	Body Diode Reverse Recovery Time	$di/dt = 100A/\mu s$ $I_S = 16A, V_{GS} = 0V$	-	468	-	ns
Q_{rr}	Reverse Recovery Charge		-	2935	-	nC

Notes:

- $T_J = -55^\circ C$ to $+150^\circ C$.
- Repetitive rating; pulse width limited by maximum junction temperature.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- $L = 10mH, V_{DD} = 50V, I_{as} = 12.0A, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.

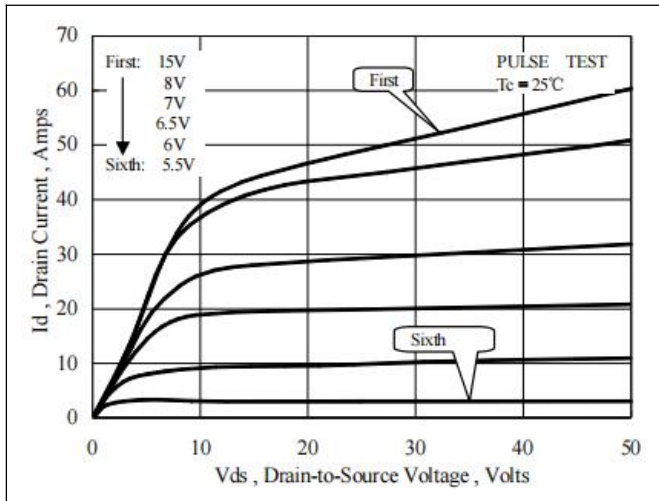


Figure 1. On-State Characteristics

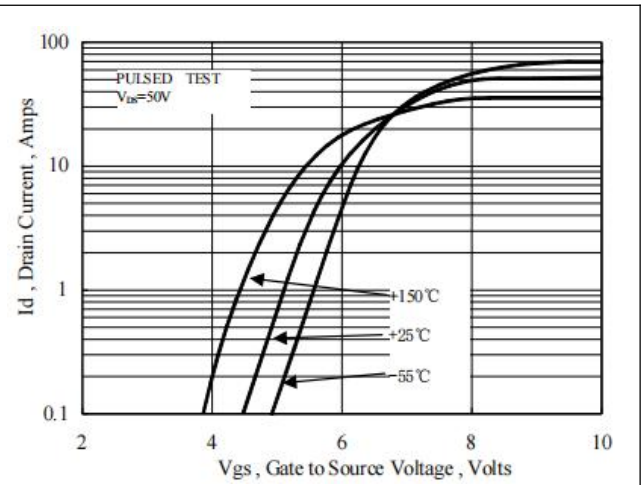


Figure 2. Transfer Characteristics

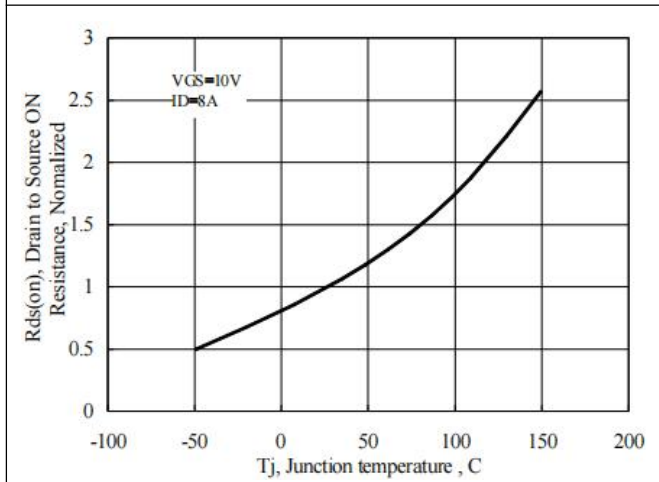


Figure 3. Normalized On-Resistance Variation with Temperature

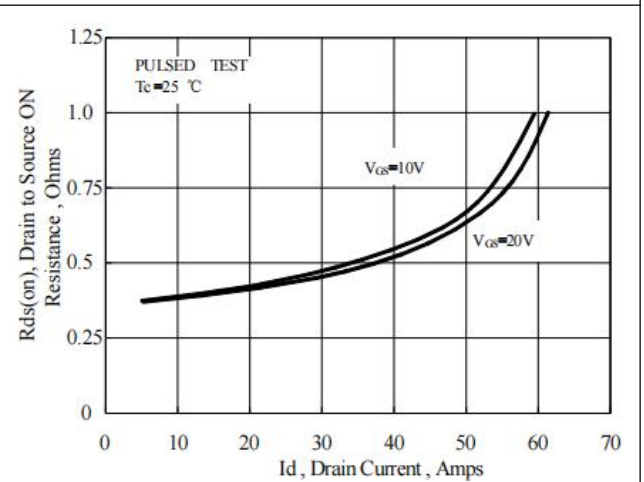


Figure 4. Typical Drain to Source On Resistance vs Drain Current

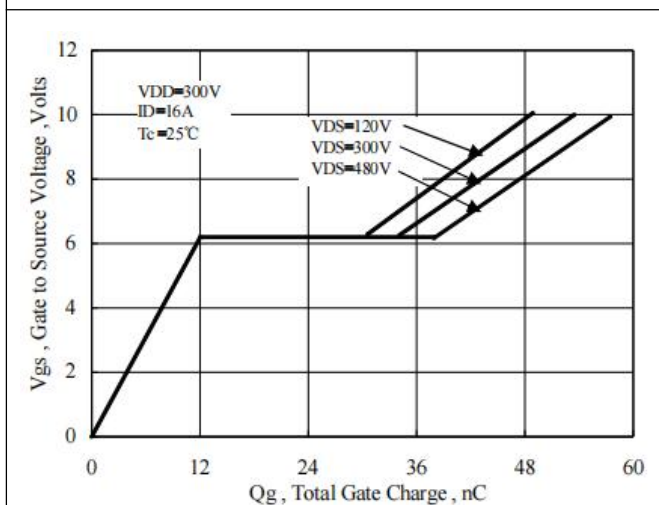


Figure 5. Gate Charge Characteristics

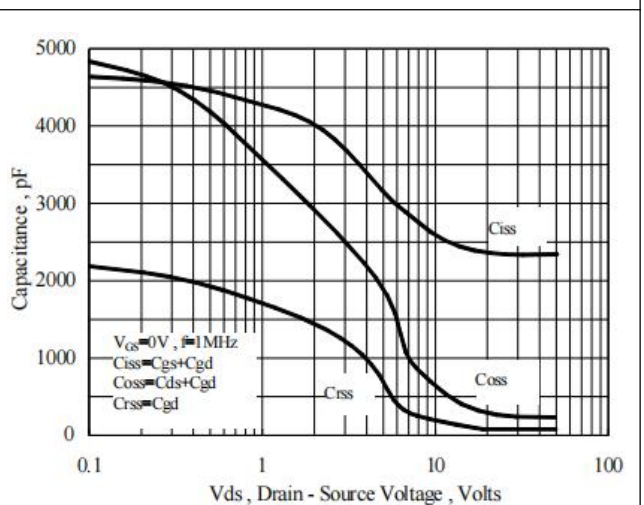


Figure 6. Capacitance Characteristics

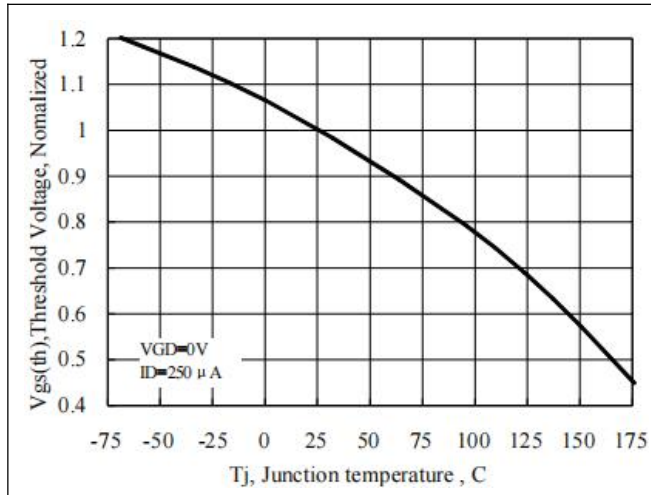


Figure 7. Typical Threshold Voltage vs Junction Temperature

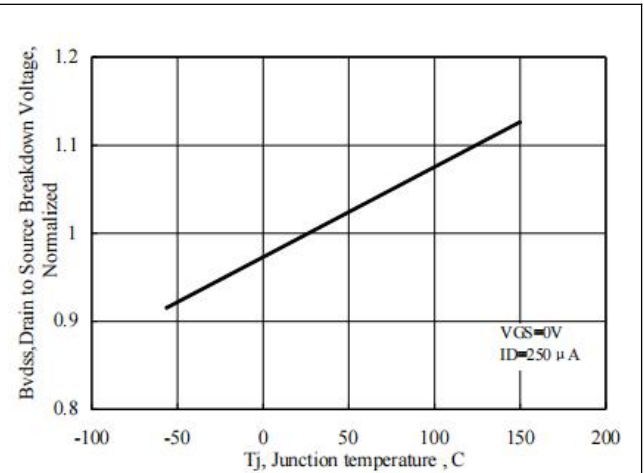


Figure 8. Typical Breakdown Voltage vs Junction Temperature

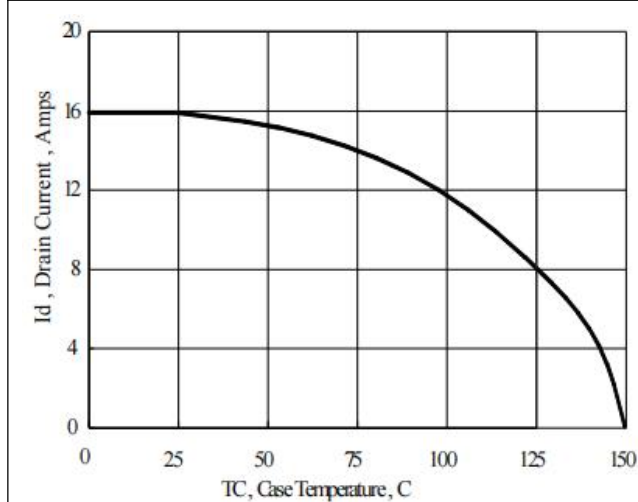


Figure 9. Maximum Continuous Drain Current vs Case Temperature

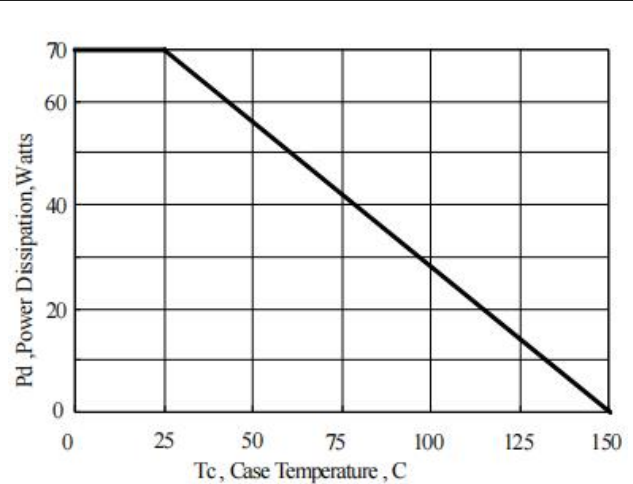


Figure 10. Maximum Power Dissipation vs Case Temperature

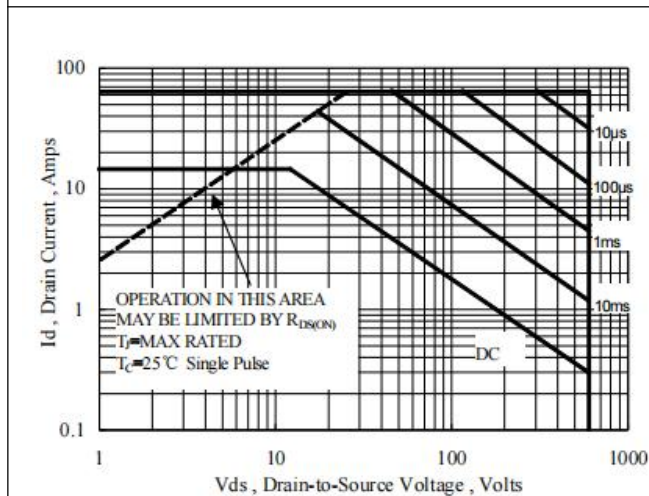


Figure 11. Maximum Forward Bias Safe Operating Area

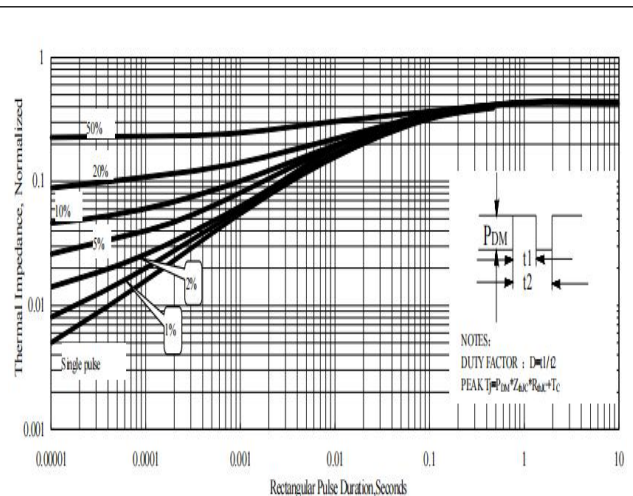


Figure 12. Maximum Effective Thermal Impedance, Junction to Case

■ Package Information

