



MPF10N65

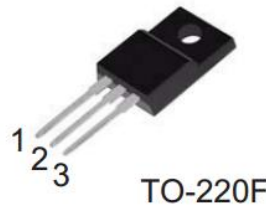
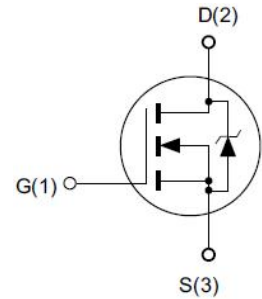
N-Channel Power MOSFET

Features

- ◆ 650V, 10A, $R_{DS(ON)}(Typ.) = 0.80\Omega @ V_{GS} = 10V$.
- ◆ Low C_{rss}
- ◆ Fast Switching
- ◆ 100% Avalanche Tested

Application

- ◆ Adapter
- ◆ LCD/PDP Adapter
- ◆ E-Bike Charger



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

Symbol	Parameter	Limit	Unit
		TO-220F	
V_{DS}	Drain-Source Voltage ^a	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, $T_c = 25^\circ C$	10	A
	Drain Current-Continuous, $T_c = 100^\circ C$	5.5	A
I_{DM}	Drain Current-Pulsed ^b	40	A
P_D	Maximum Power Dissipation @ $T_J = 25^\circ C$	40	W
E_{AS}	Single Pulsed Avalanche Energy ^d	405	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.	3.12	$^\circ C/W$
$R_{\theta JA}$	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	$V_{GS} = 0V, I_D = 250\mu A$	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 30V$	-	-	± 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	-	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^c	$V_{GS} = 10V, I_D = 5A$	-	0.80	1.00	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS} = 25V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	-	1595	-	pF
C_{oss}	Output Capacitance		-	134	-	pF
C_{rss}	Reverse Transfer Capacitance		-	6.6	-	pF

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 325V, I_D = 10A,$ $R_G = 25\Omega, V_{GS} = 10V$	-	25	-	ns
t_r	Turn-On Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	50	-	ns
t_f	Turn-Off Fall Time		-	23	-	ns
Q_g	Total Gate Charge	$V_{DS} = 325V, I_D = 10A,$ $V_{GS} = 10V$	-	31.9	-	nC
Q_{gs}	Gate-Source Charge		-	8.1	-	nC
Q_{gd}	Gate-Drain Charge		-	11.9	-	nC

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_{GS} = 0V$	-	-	10	A
I_{SM}	Maximum Pulsed Current	$V_{GS} = 0V$	-	-	40	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 10A$	-	-	1.4	V
T_{rr}	Body Diode Reverse Recovery Time	$di/dt = 100A/\mu s$ $I_S = 10A, V_{GS} = 0V$	-	498	-	ns
Q_{rr}	Reverse Recovery Charge		-	3039	-	nC

Notes:

- $T_J = +25\text{ }^\circ\text{C}$ to $+150\text{ }^\circ\text{C}$
- Repetitive rating; pulse width limited by maximum junction temperature.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$
- $L = 10mH, V_{DD} = 50V, I_{as} = 9A, R_G = 25\Omega$ Starting $T_J = 25\text{ }^\circ\text{C}$

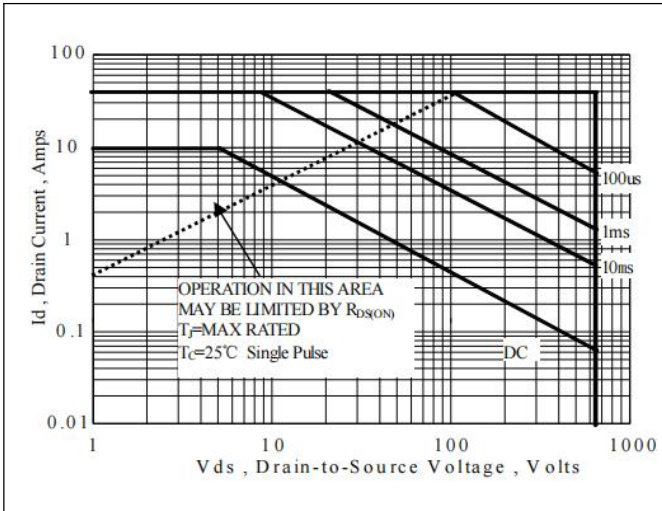


Figure1. Maximum Safe Operating Area

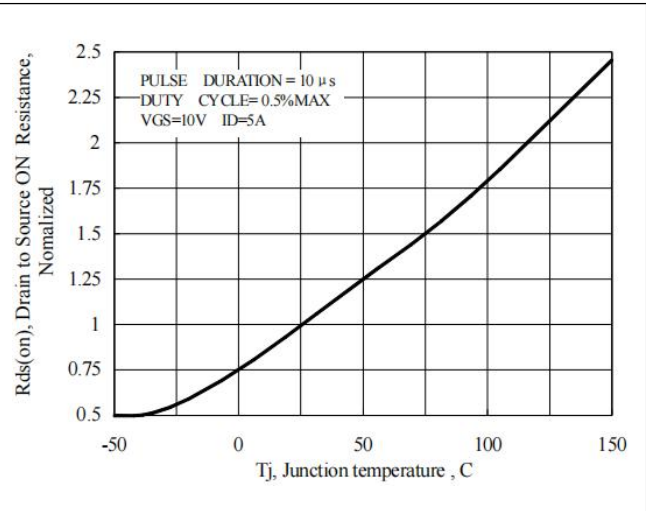


Figure2. Normalized On-Resistance Variation with Temperature

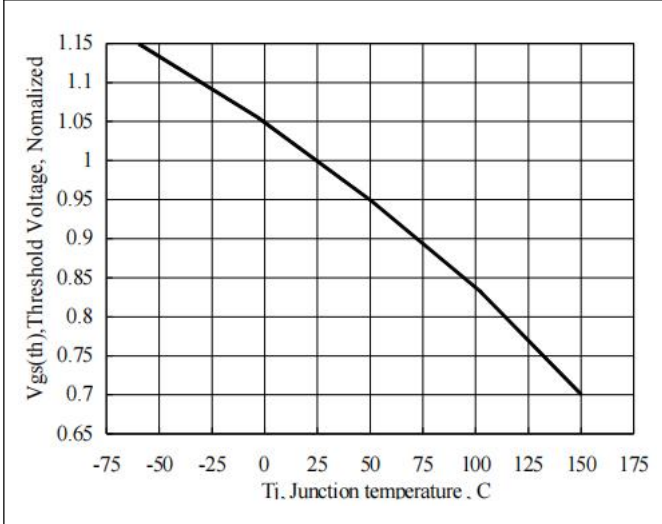


Figure 3. Gate Threshold Variation with Temperature

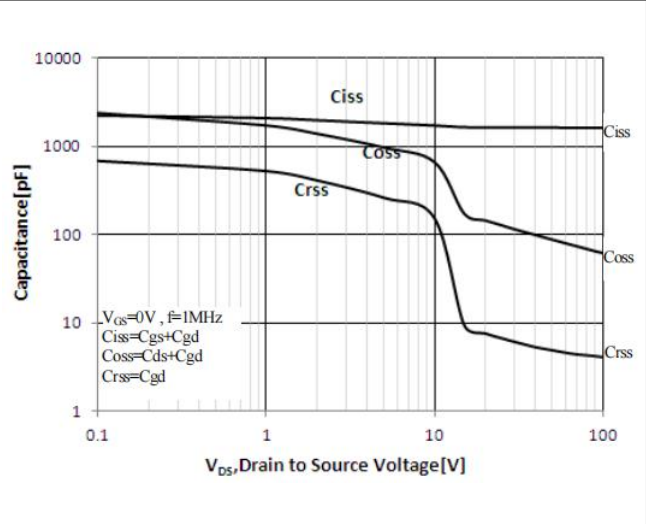


Figure 4. Capacitance Characteristics

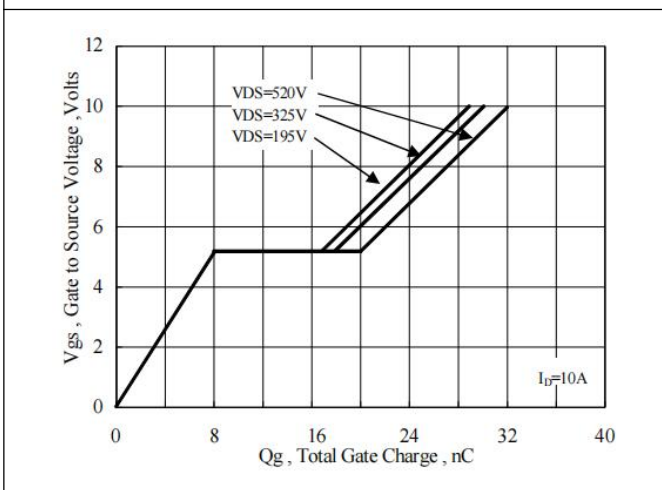


Figure 5. Gate Charge Characteristics

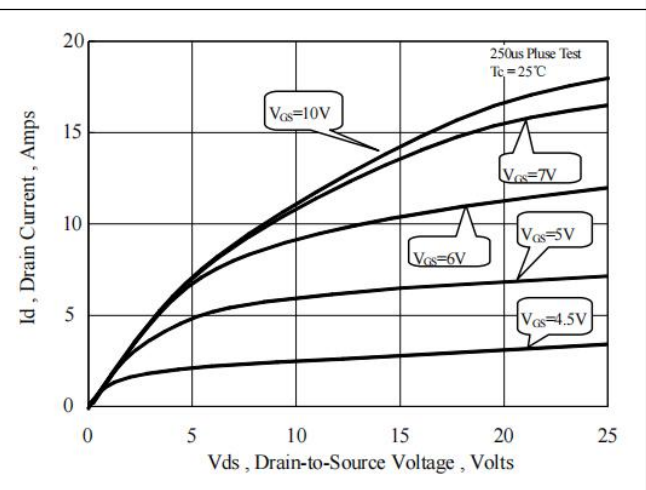


Figure 6. On-State Characteristics

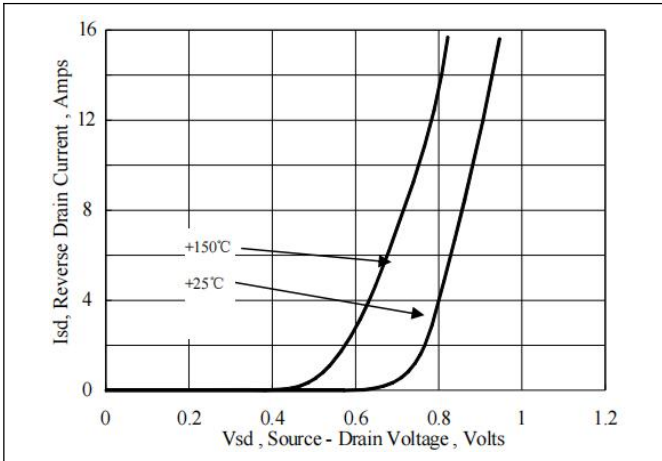


Figure 7. Body Diode Forward Voltage Variation with Source Current

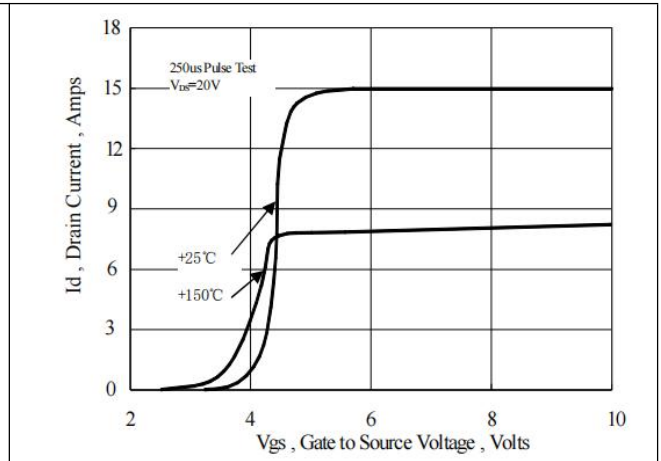


Figure 8. Transfer Characteristics Variation with Source Current

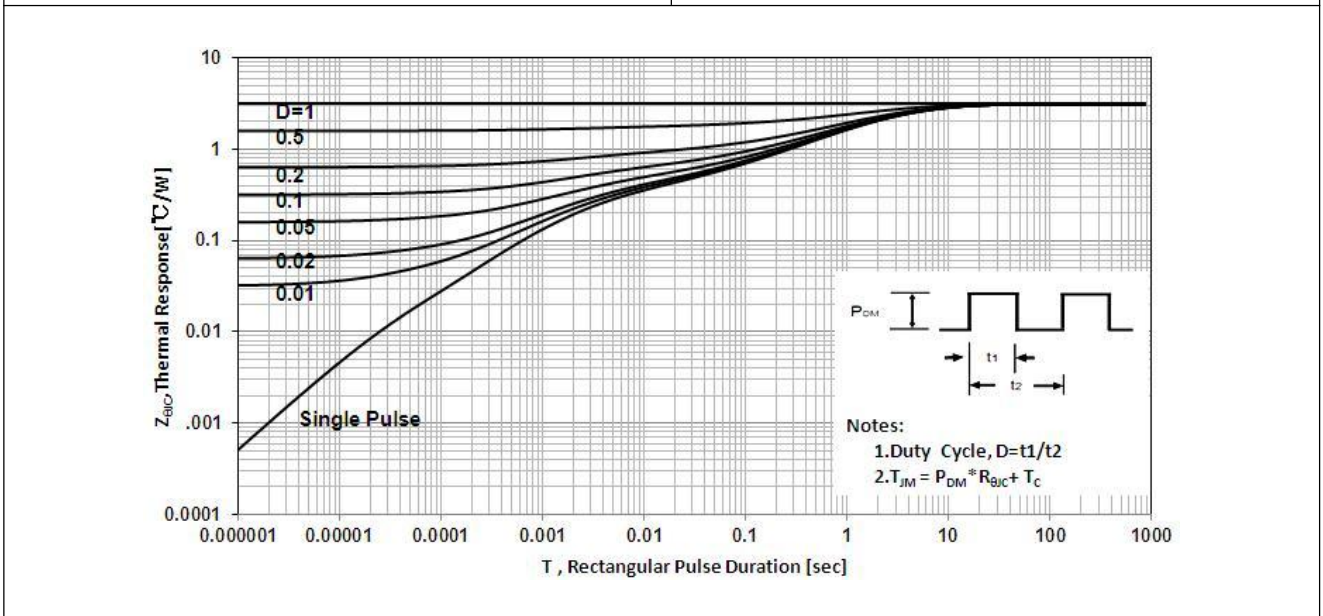


Figure 9. Maximum Effective Thermal Impedance , Junction to Case

■ Package Information

