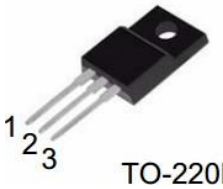
MPF10N65B

N-Channel Power MOSFET

Features

- 650V,10A, $R_{DS(on)}$(Typ.) = 0.82Ω@V_{GS} = 10V
- Low Gate Charge
- Low C_{rss}
- 100% Avalanche Tested
- Fast Switching



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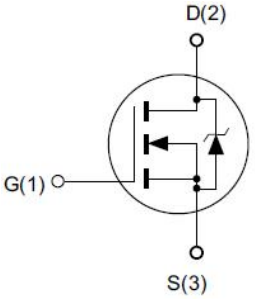

Application

- TV Power
- A dapter/Charger
- Switch Mode Power Supply
- Uninterruptible Power Supply

Absolute Maximum Ratings Tc = 25°C unless otherwise noted

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage [a]		650	V
V_{GS}	Gate-Source Voltage		±30	
I_D	Drain Current-Continuous	T_C = 25°C	10	A
		T_C = 100°C	6.5	
I_{DM}	Drain Current-Pulsed [b]		40	
P_D	Maximum Power Dissipation, T_J = 25°C		48	W
dv/dt	Peak Diode Recovery dv/dt [c]		5.0	V/ns
E_{AS}	Single Pulsed Avalanche Energy [d]		700	mJ
T_J, T_{STG}	Operating and Store Temperature Range		150, -55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.7	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	82	

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	655	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, V_{GS} = 0V	-	-	1.0	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	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance [c]	V_{GS} = 10V, I_D = 5.0A	-	0.82	0.95	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	f = 1.0MHz	-	2.8	-	Ω
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	1740	-	pF
C_{oss}	Output Capacitance		-	120	-	
C_{rss}	Reverse Transfer Capacitance		-	5.8	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 325V, V_{GS} = 10V, I_D = 10A, R_G= 25Ω	-	34	-	ns
t_r	Turn-On Rise Time		-	65	-	
$t_{d(off)}$	Turn-Off Delay Time		-	50	-	
t_f	Turn-Off Fall Time		-	32	-	
Q_g	Total Gate Charge	V_{DD} = 520V, V_{GS} = 0 to 10V, I_D = 10A	-	32	-	nC
Q_{gs}	Gate-Source Charge		-	12.6	-	
Q_{gd}	Gate-Drain Charge		-	8.4	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_s = 10A	-	-	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	V_R = 400V, I_F = 10A dI_F/dt = 100A/μs	-	720	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	9.2	-	μC
I_{rrm}	Peak reverse recovery current		-	TBD	-	A

Notes:

a. T_J = +25 ℃ to +150 ℃.

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

c. Pulse width ≦ 300μs; duty cycle ≦ 2%.

d. L = 15mH, V_{DD} = 50V, I_{AS} = 10A, R_G = 25Ω Starting T_J = 25 ℃.

■ Characteristic Curve

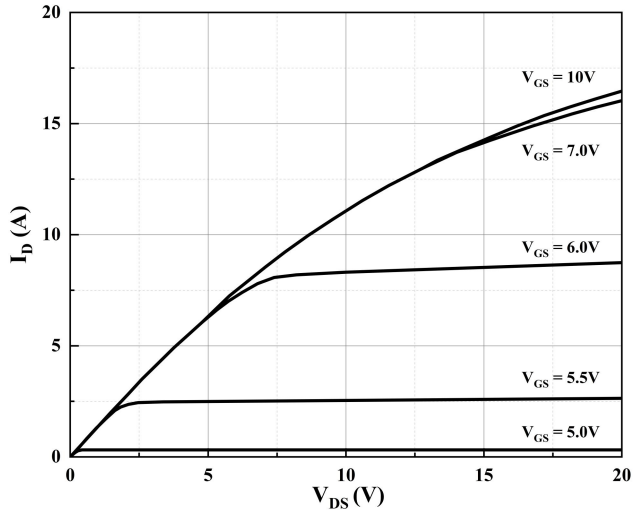

Figure 1. Typical Output Characteristics

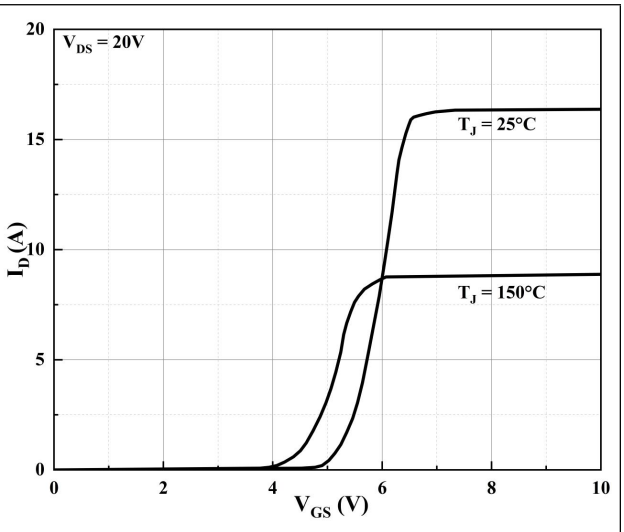

Figure 2. Typical Transfer Characteristics

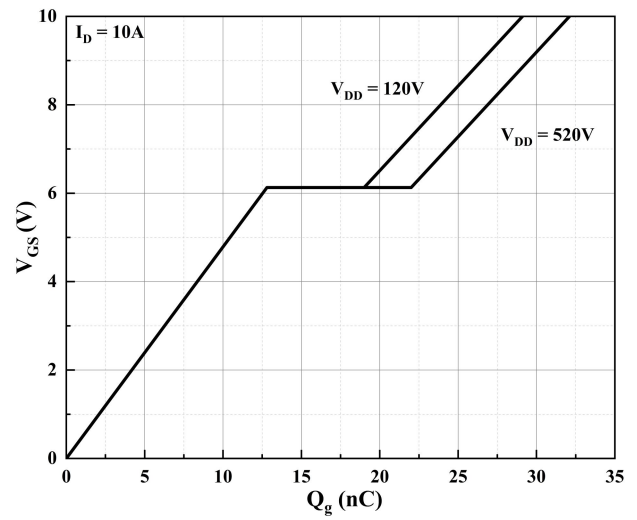

Figure 3. Typical Gate Charge

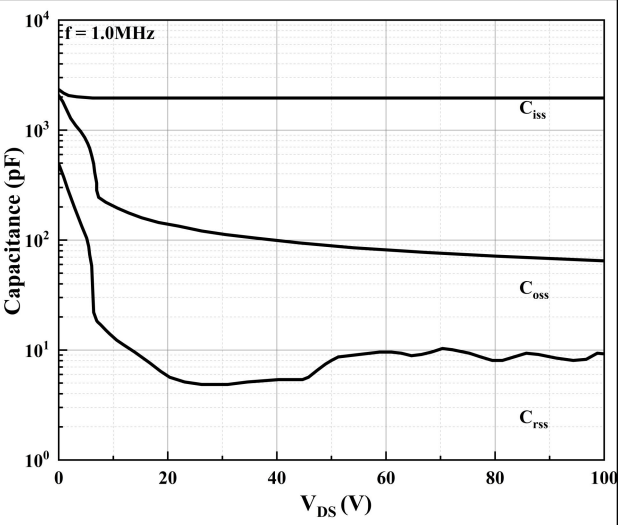

Figure 4. Typical Capacitance

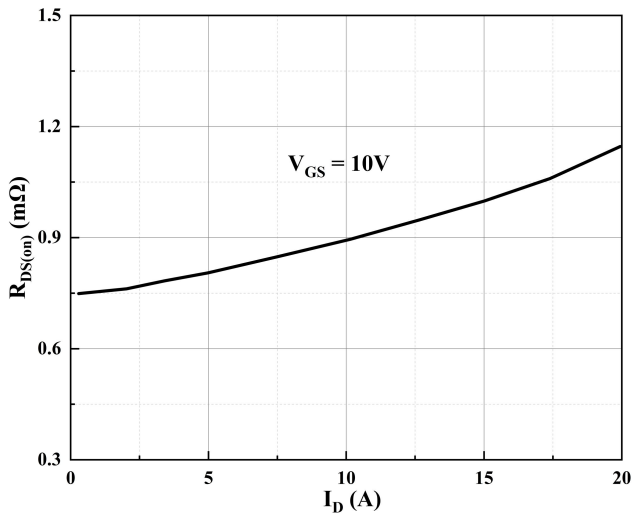

Figure 5. Static Drain-Source On-Resistance vs. Drain Current

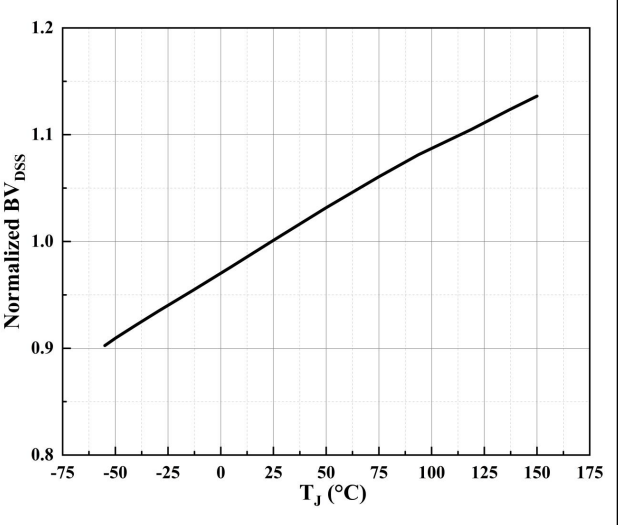

Figure 6. Drain-source Breakdown Voltage

■ **Package Information**

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