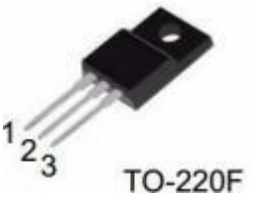
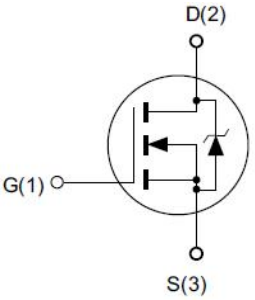
MPF12N65A

N-Channel Power MOSFET

Features

- 650V, 12A, $R_{DS(ON)}$(Typ.) = 0.64Ω@VGS = 10V.
- Low Crss
- Fast Switching
- 100% Avalanche Tested





Application

- Adaptor
- Standby Power
- Switching power supply
- LED Power

Absolute Maximum Ratings T_C = 25° C unless otherwise noted

Symbol	Parameter	Rating	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	12	A
	Drain Current-Continuous, T_C =100°C	7	A
I_{DM}	Drain Current-Pulsed [b]	48	A
P_D	Maximum Power Dissipation @ T_J =25°C	43	W
E_{AS}	Single Pulsed Avalanche Energy [c]	605	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	2.85	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	54	°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	-	-	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} = ±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	V_{GS} = 10V, I_D = 6A	-	0.64	0.75	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	2078	-	pF
Coss	Output Capacitance		-	170	-	pF
Crss	Reverse Transfer Capacitance		-	21	-	pF

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 325V, I_D =12A, V_{GS}=10V, R_{GEN}=24Ω	-	31	-	ns
t_r	Turn-On Rise Time		-	43	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	133	-	ns
t_f	Turn-Off Fall Time		-	53	-	ns
Qg	Total Gate Charge	V_{DS} = 520V, I_D =12A, V_{GS} = 10V	-	47		nC
Qgs	Gate-Source Charge		-	11	-	nC
Qgd	Gate-Drain Charge		-	18	-	nC

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	V_{GS} = 0V	-	-	12	A
I_{SM}	Maximum Pulsed Current	V_{GS} = 0V	-	-	48	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 12A	-	-	1.4	V
Trr	Body Diode Reverse Recovery Time	I_S=12A,V_{GS} = 0V dI_F/dt=100A/us	-	432	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	5.1	-	uC

Notes:

a. T_J=+25 ℃ to +150 ℃

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

c. L = 10mH, V_{DD}=50V,I_{AS} = 11A,R_G=25Ω Starting T_J=25 ℃ .

■ Characteristic Curve

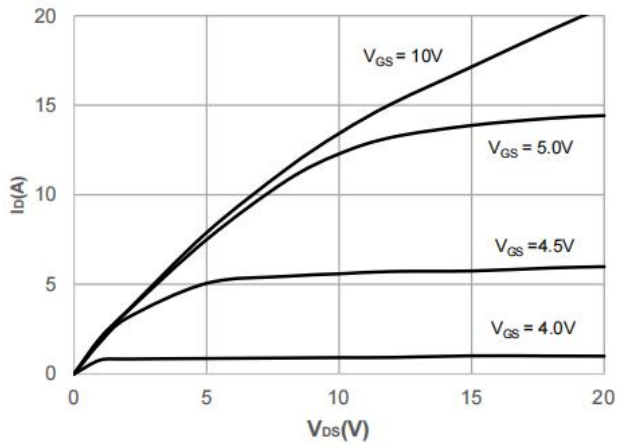


Figure 1. Typical Output Characteristics

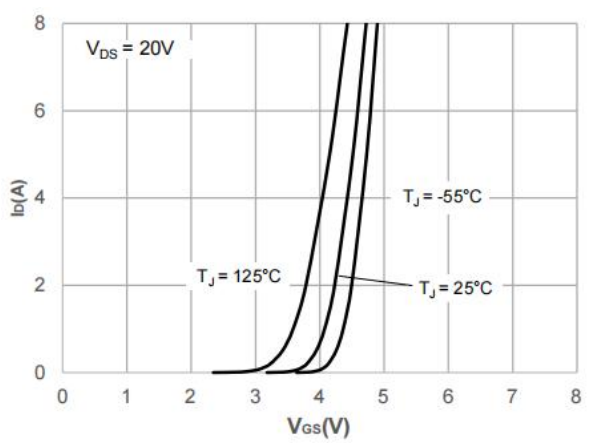


Figure 2. Typical Transfer Characteristics

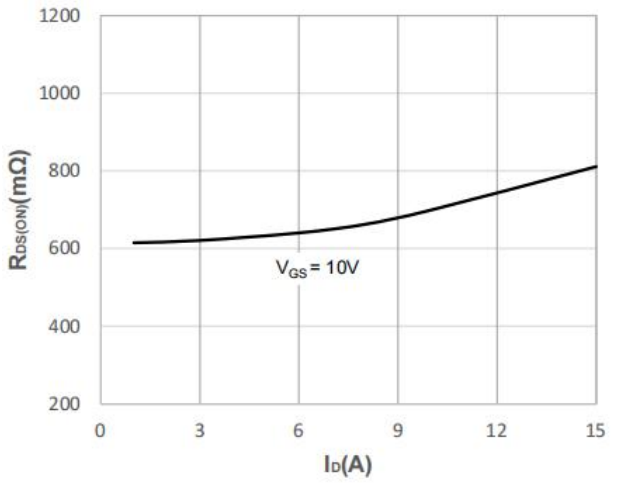


Figure 3. On- Resistance vs. Drain Current

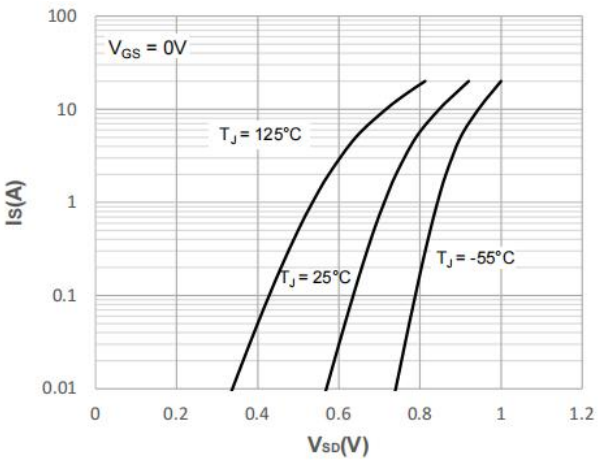


Figure 4.Body-Diode Characteristics

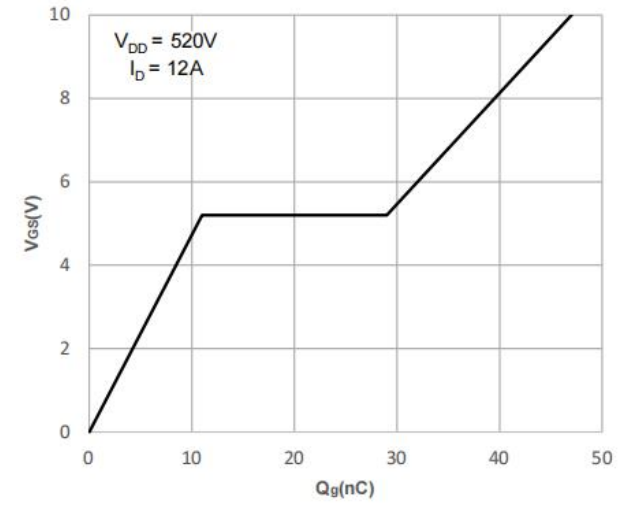


Figure 5. Gate-Charge Characteristics

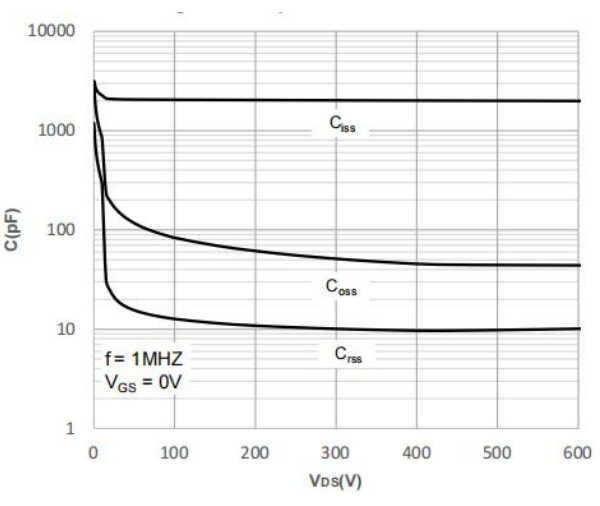


Figure 6.Capacitance Characteristics

Characteristic Curve

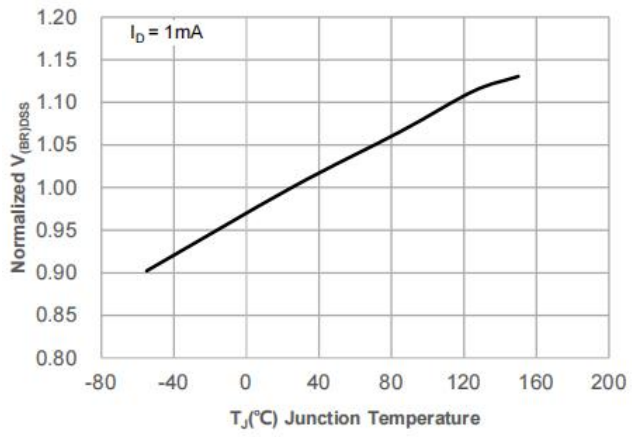


Figure 7.Normalized Breakdown voltage vs. Junction Temperature

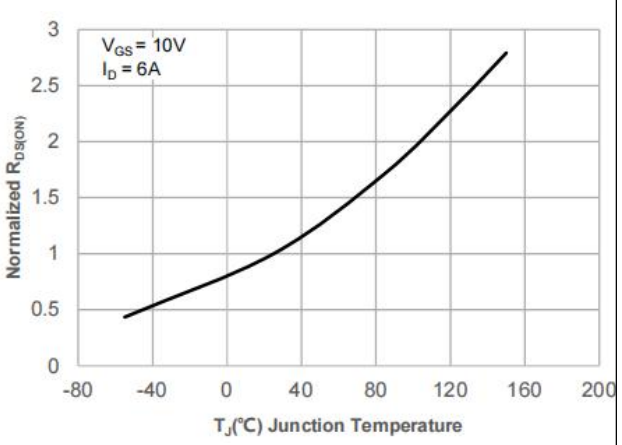


Figure 8. Normalized on Resistance vs. Junction Temperature

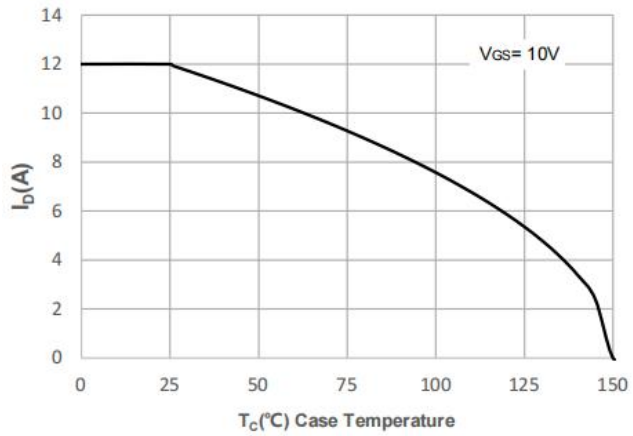


Figure 9: Maximum Continuous Drain Current vs. Case Temperature

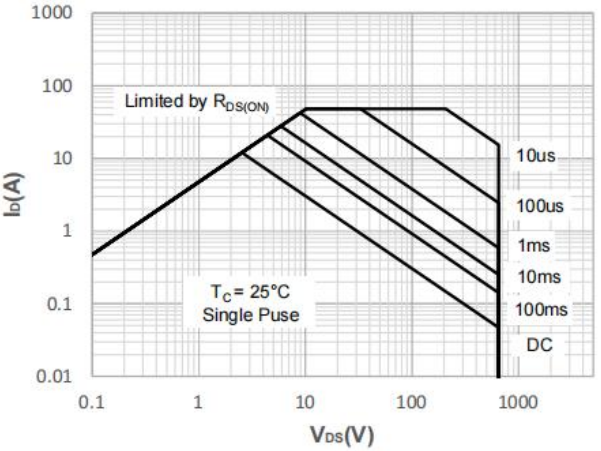


Figure 10:Maximum Safe Operating Area

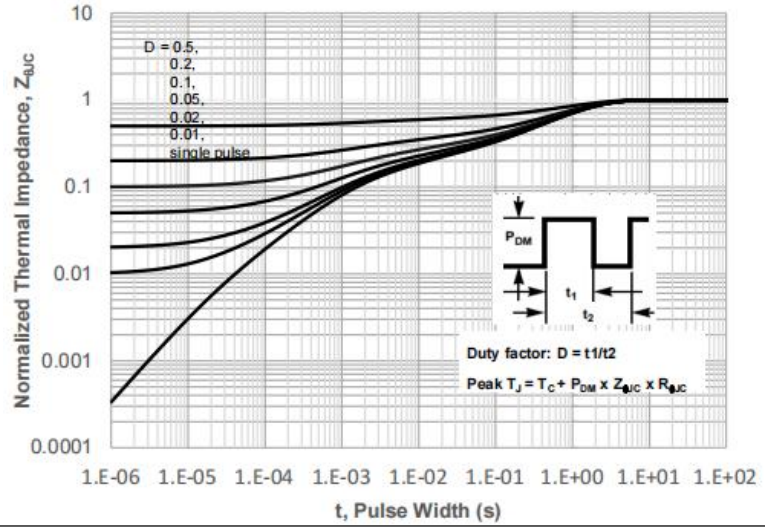


Figure 11: Normalized Maximum Transient Thermal Impedance

■ Package Information