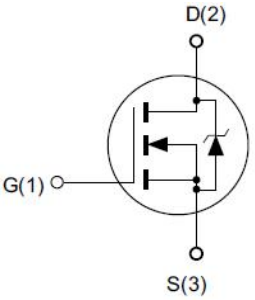
MPD07N65

N-Channel Power MOSFET

Features

- 650V, 7A, $R_{DS(ON)}$(Max.) = 1.4Ω@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	Limit	Unit
		TO-252	
V_{DS}	Drain-Source Voltage [a]	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, T_C =25°C	7	A
	Drain Current-Continuous, T_C =100°C	4.4	A
I_{DM}	Drain Current-Pulsed [b]	28	A
P_D	Maximum Power Dissipation @ T_J =25°C	100	W
dv/dt	Peak Diode Recovery dv/dt [c]	5.0	V/ns
E_{AS}	Single Pulsed Avalanche Energy [d]	320	mJ
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Junction-to-Case	1.25	°C/W
$R_{\theta JA}$	Junction-to-Ambient	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	-	-	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 = 3.5A	-	1.1	1.4	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	1130	-	pF
Coss	Output Capacitance		-	93	-	pF
Crss	Reverse Transfer Capacitance		-	5.5	-	pF

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 325V, I_D =7A, V_{GS}=10V	-	19	-	ns
t_r	Turn-On Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	42	-	ns
t_f	Turn-Off Fall Time		-	19	-	ns
Qg	Total Gate Charge	V_{DS} = 520V, I_D =7A, V_{GS} = 10V	-	24		nC
Qgs	Gate-Source Charge		-	5.1	-	nC
Qgd	Gate-Drain Charge		-	9.5	-	nC

Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	V_{GS} = 0V	-	-	7	A
I_{SM}	Maximum Pulsed Current	V_{GS} = 0V	-	-	28	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_S = 7A	-	-	1.4	V
Trr	Body Diode Reverse Recovery Time	di/dt=100A/us Is=7A,V_{GS} = 0V	-	380	-	ns
Qrr	Body Diode Reverse Recovery Charge	di/dt=100A/us Is=7A,V_{GS} = 0V	-	1900	-	nC

Notes:

a. T_J=+25 ℃ to +150 ℃

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

c. I_{SD} =7A, di/dt ≤100A/us,V_{DD}≤BV_{DS}, Start TJ=25℃

d. L = 10mH, VDD=50V,IAS = 8.0A,R_G=25Ω Starting T_J=25 ℃

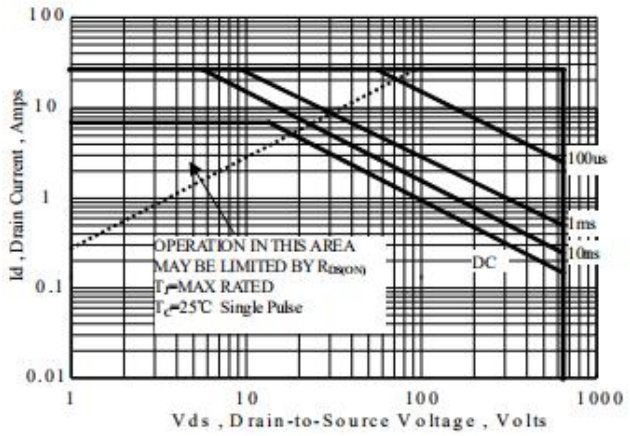


Figure 1. Maximum Forward Bias Safe Operating Area

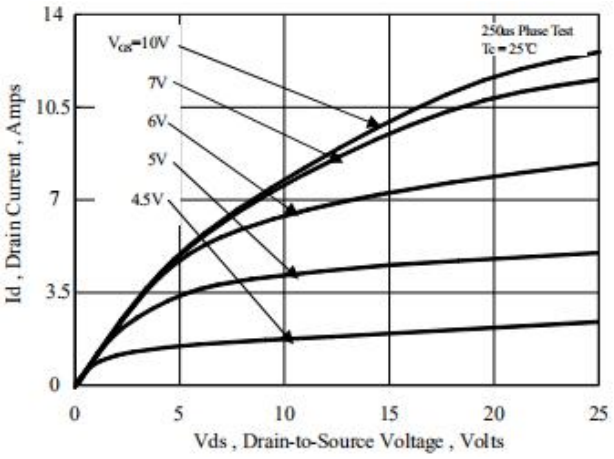


Figure 2. On-State Characteristics

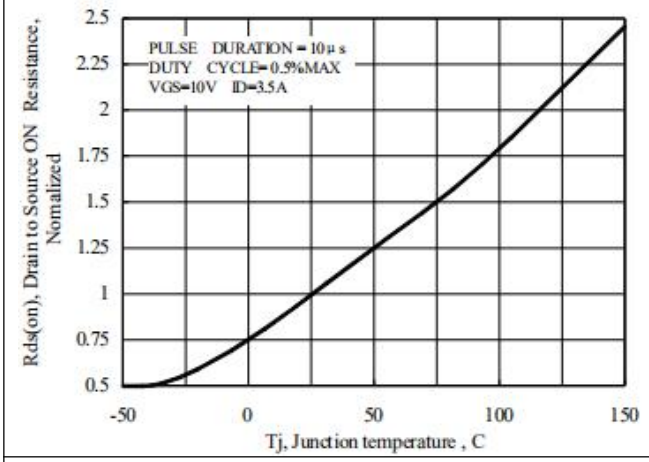


Figure 3. Normalized On-Resistance Variation with Temperature

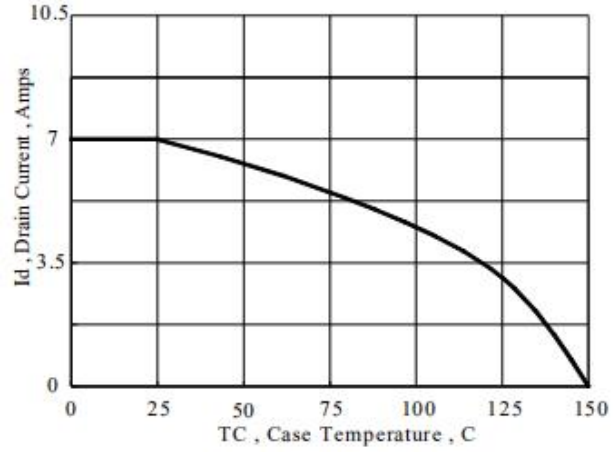


Figure 4. Maximum Continuous Drain Current vs Case Temperature

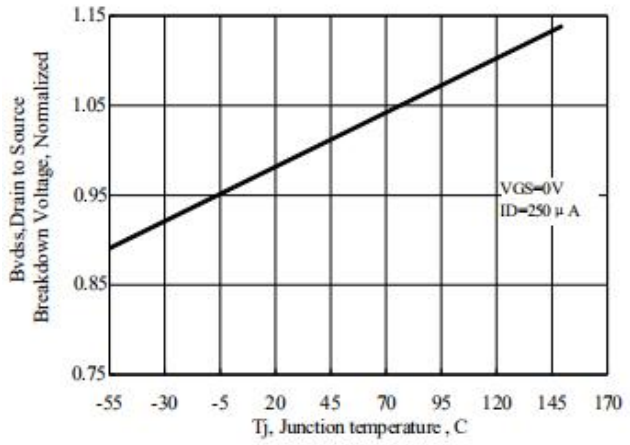


Figure 5 .Typical Breakdown Voltage vs Junction Temperature

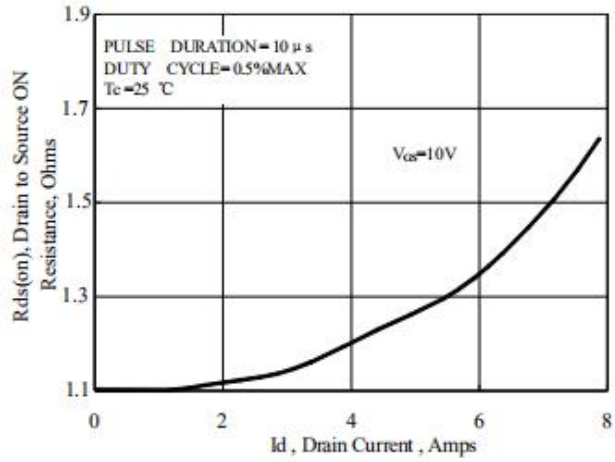


Figure 6. Typical Drain to Source ON Resistance vs Drain Current

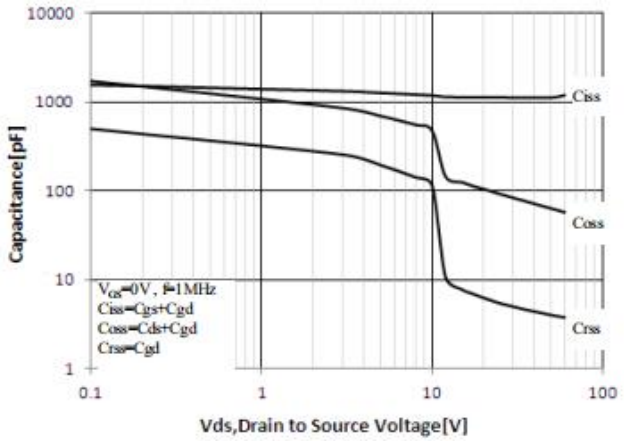


Figure 7. Typical Capacitance vs Drain to Source Voltage

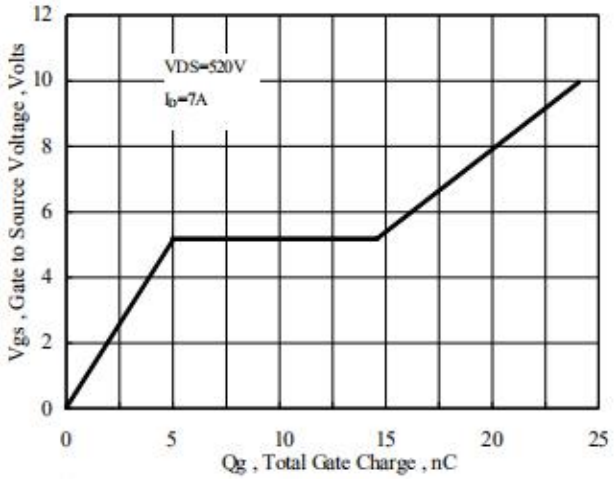


Figure 8. Typical Gate Charge vs Gate to Source Voltage

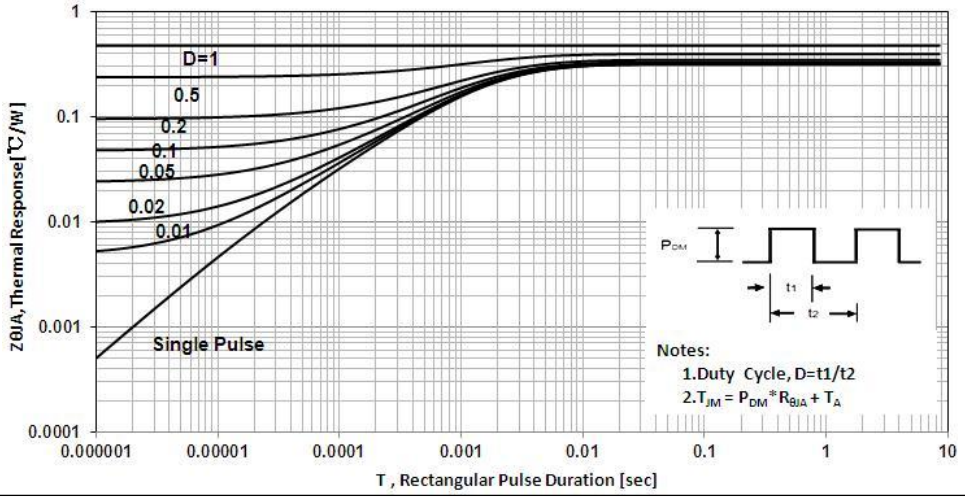


Figure 9 .Normalized Effective Transient Thermal Impedance With Pulse Duration(TO-252)

■ Package Information