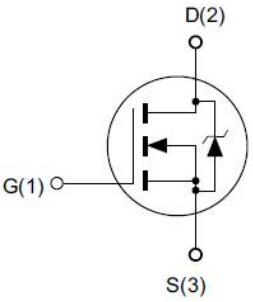
MPC10N65

N-Channel Power MOSFET

Features

- ◆ 650V, 10A, $R_{DS(ON)}$(Typ.) = 0.80Ω@VGS = 10V.
- ◆ Low Crss
- ◆ Fast Switching
- ◆ 100% Avalanche Tested

TO-220



Application

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

Absolute Maximum Ratings T_C = 25° C unless otherwise noted

Symbol	Parameter	Limit	Unit
		TO-220	
V_{DS}	Drain-Source Voltage [a]	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, T_C =25°C	10	A
	Drain Current-Continuous, T_C =100°C	5.5	A
I_{DM}	Drain Current-Pulsed [b]	40	A
P_D	Maximum Power Dissipation @ T_J =25°C	130	W
E_{AS}	Single Pulsed Avalanche Energy [d]	405	mJ
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max.	0.96	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max.	62.5	°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	2.0	-	4.0	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
Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	1595	-	pF
Coss	Output Capacitance		-	134	-	pF
Crss	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 = 25Ω,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
Qg	Total Gate Charge	V_{DS} = 325V, I_D =10A, V_{GS} = 10V	-	31.9		nC
Qgs	Gate-Source Charge		-	8.1	-	nC
Qgd	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
Trr	Body Diode Reverse Recovery Time	di/dt=100A/us I_S=10A,V_{GS}=0V	-	411	-	ns
Qrr	Reverse Recovery Charge		-	3039	-	nC

Notes:

a. TJ=+25 ℃ to +150 ℃

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

c. Pulse width≦300us; duty cycle≦2%

d. L=10mH, VDD=50V,Ias=9A,RG=25Ω Starting TJ=25 ℃

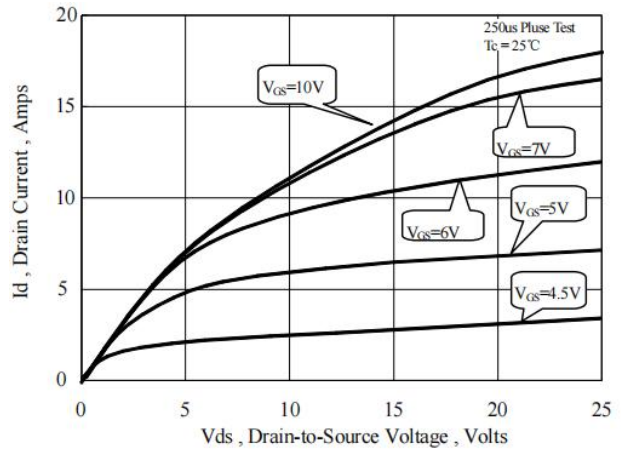


Figure1.On-State Characteristics

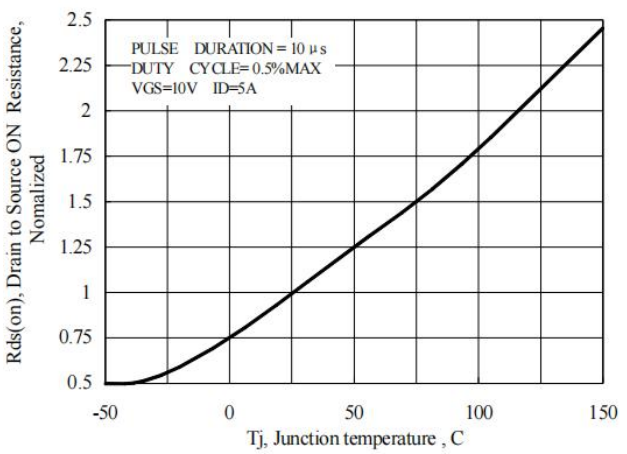


Figure2. Normalized On-Resistance Variation with Temperature

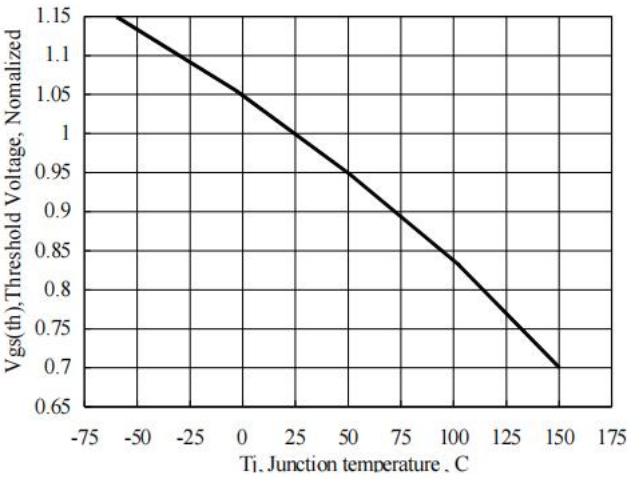


Figure 3. Gate Threshold Variation with Temperature

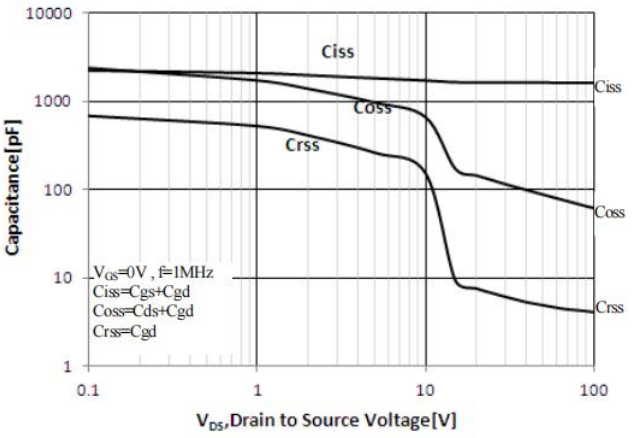


Figure 4. Capacitance Characteristics

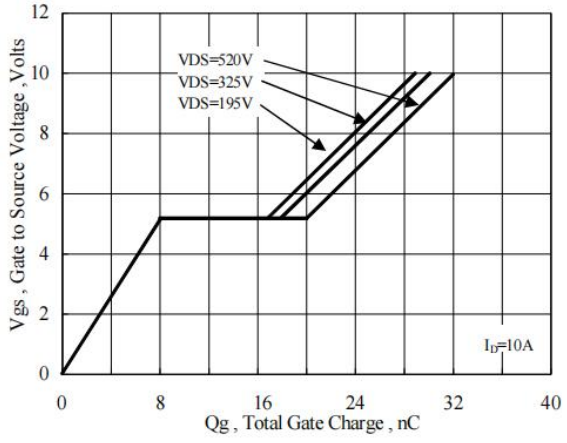


Figure 5. Gate Charge Characteristics

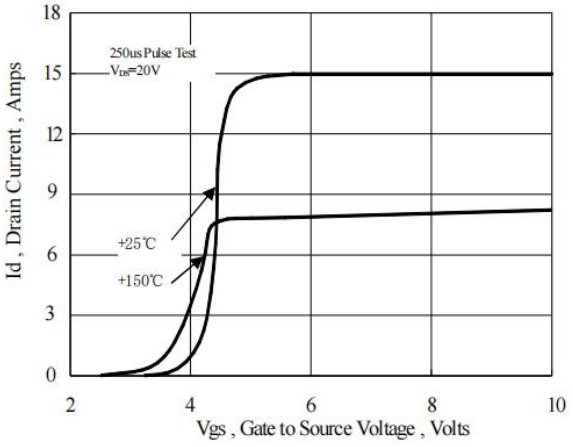


Figure 6. Transfer Characteristics Variation with Source Current

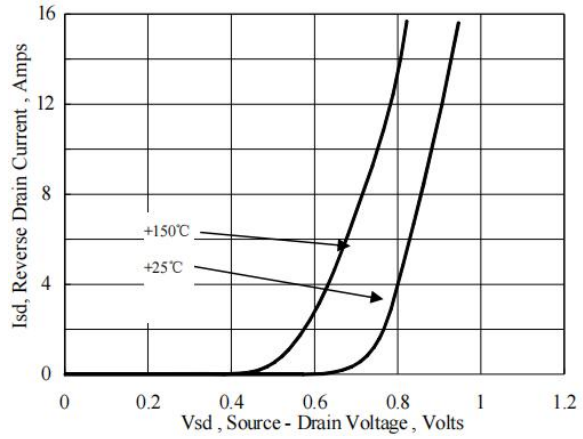


Figure 7. Body Diode Forward Voltage Variation with Source Current

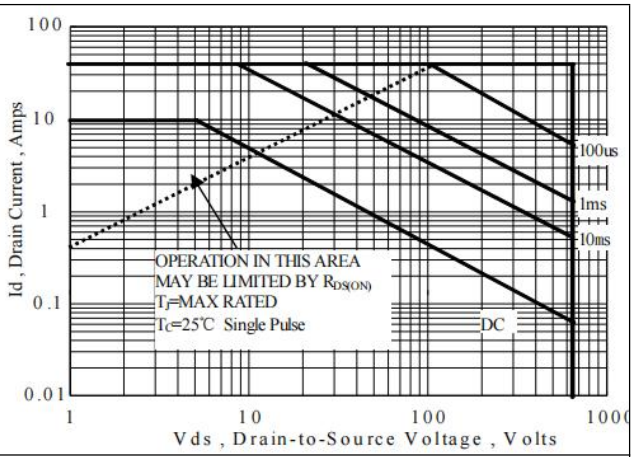


Figure 8. Maximum Safe Operating Area

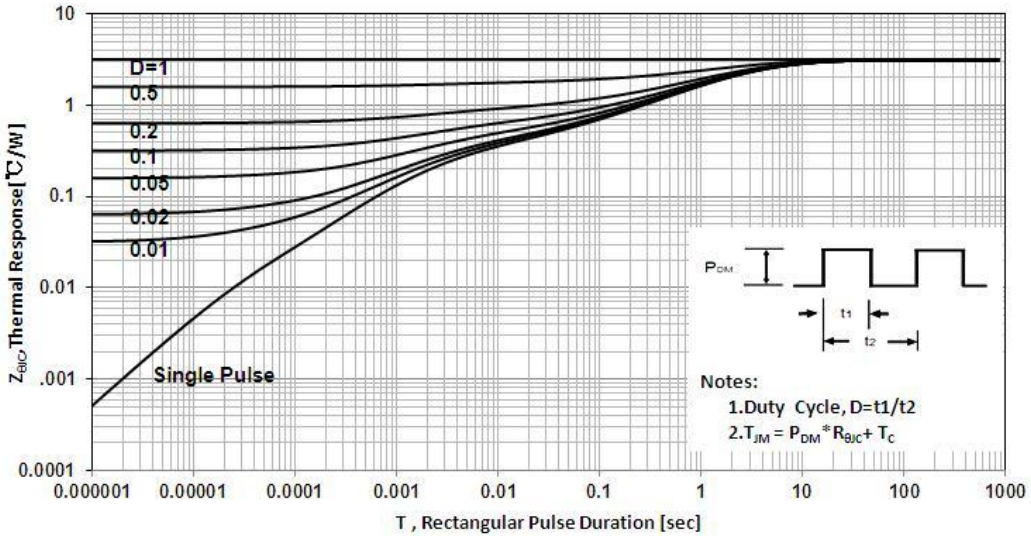
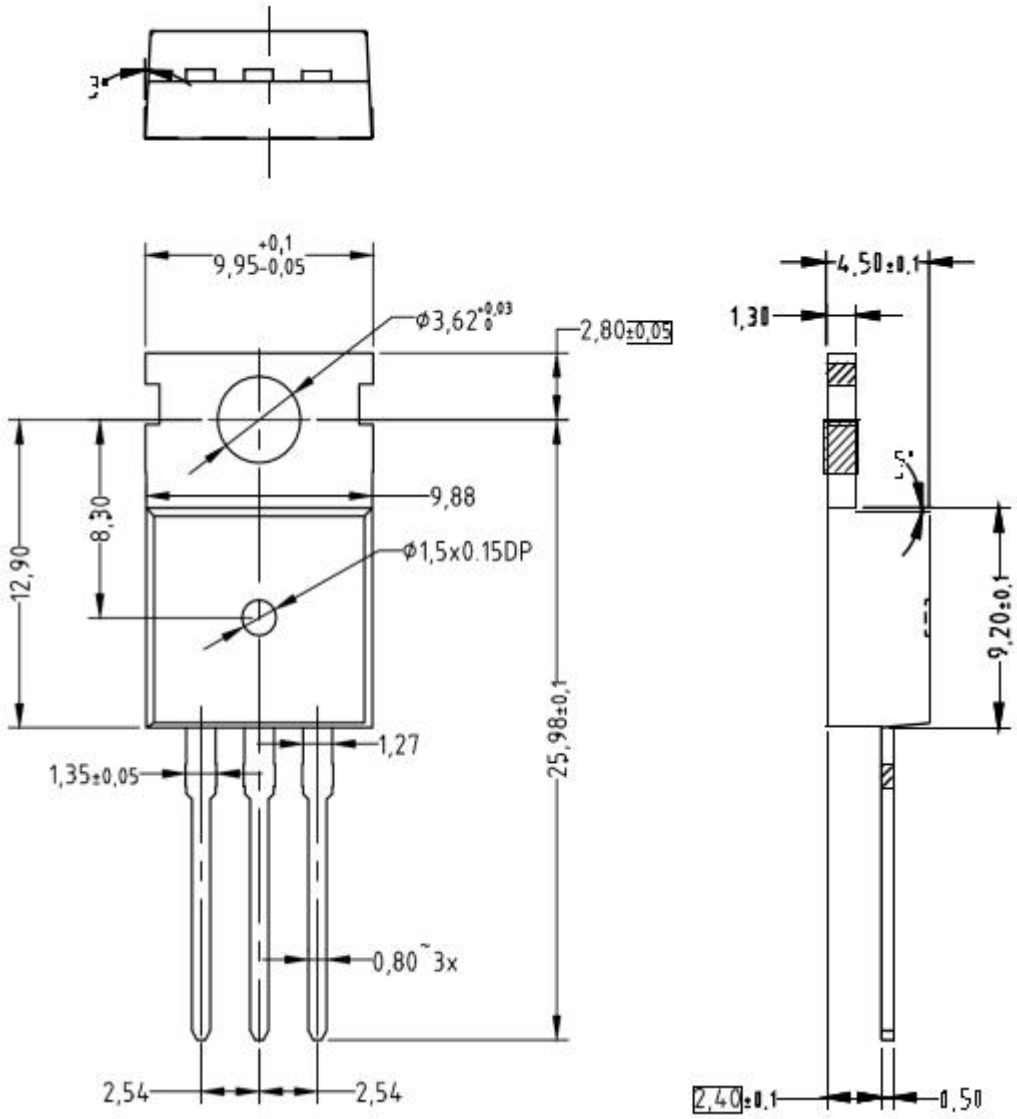


Figure 9. Maximum Effective Thermal Impendance , Junction to Case

■ Package Information