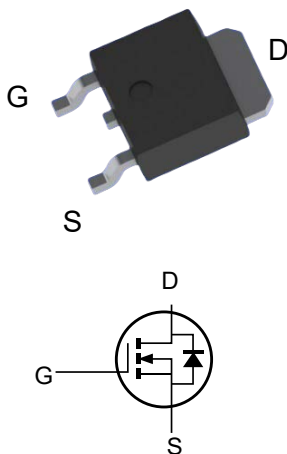


650V N-Channel Power MOSFET

MPR7N65D
TO-252



Features

- Low gate charge
- Low Ciss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Application

- Power factor correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible Power Supply (UPS)
- AC to DC Converters
- Telecom, Solar

Maximum ratings, at $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage	650	V
VGS	Gate-Source voltage	± 30	V
ID	Continuous drain current	7	A
IDM	Pulse drain current tested ①	28	A
EAR	Repetitive Avalanche Energy ①	55	mJ
EAS	Avalanche energy, single pulsed ②	450	mJ
PD	Power Dissipation	95	W
TSTG,TJ	Storage and Junction Temperature Range	-55 to 150	$^\circ\text{C}$

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② EAS condition: $T_J = 25^\circ\text{C}$, $I_D = 9.5\text{A}$, $L = 10\text{mH}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	1.32	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)

V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current@25°C	V _{DS} =650V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current@125°C	V _{DS} =520V, V _{GS} =0V	--	--	250	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2	--	4	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =3A	--	1.0	1.35	Ω

Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)

C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	1050	--	pF
C _{oss}	Output Capacitance		--	90	--	pF
C _{rss}	Reverse Transfer Capacitance		--	4.5	--	pF
Q _g	Total Gate Charge	V _{DS} =325V, I _D =7A, V _{GS} =10V	--	24	--	nC
Q _{gs}	Gate-Source Charge		--	5	--	nC
Q _{gd}	Gate-Drain Charge		--	8	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DD} =325V, I _D =7A, R _G =9.1Ω, V _{GS} =10V, T _j =25°C	--	11	--	ns
Tr	Turn-on Rise Time		--	10	--	ns
Td(off)	Turn-Off Delay Time		--	36	--	ns
Tf	Turn-Off Fall Time		--	18	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

I _S	Maximum Continuous Drain to Source Diode Forward Current	--	--	7	A
I _{SM}	Pulsed Diode Forward Current	--	--	28	A
V _{SD}	Forward on voltage	I _{SD} =7A, V _{GS} =0V	--	--	1.5 V
T _{rr}	Reverse Recovery Time	I _S =7A, V _{GS} =0V	--	280	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	1.2	μC

Typical Characteristics

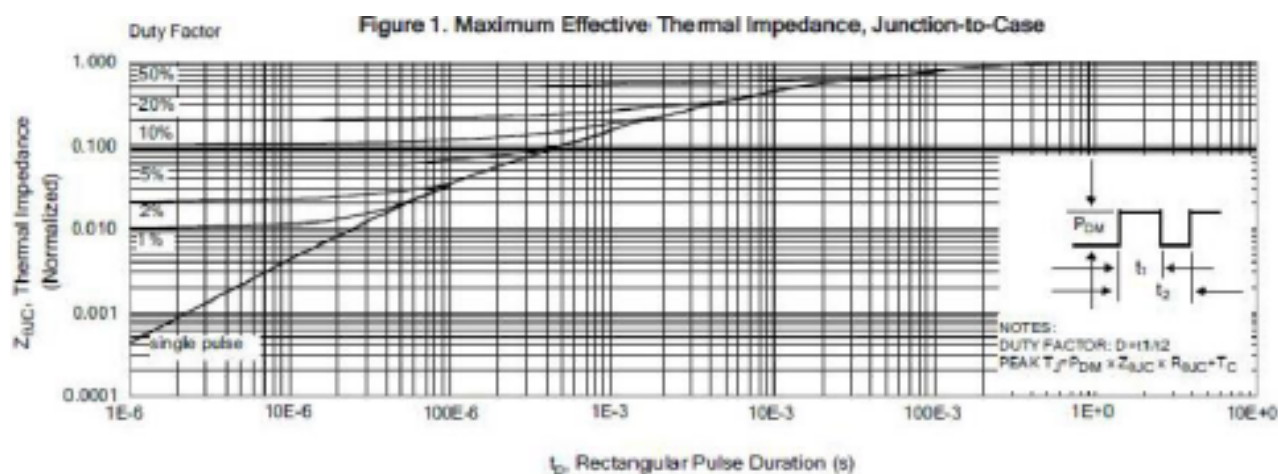


Figure 2. Maximum Power Dissipation vs Case Temperature

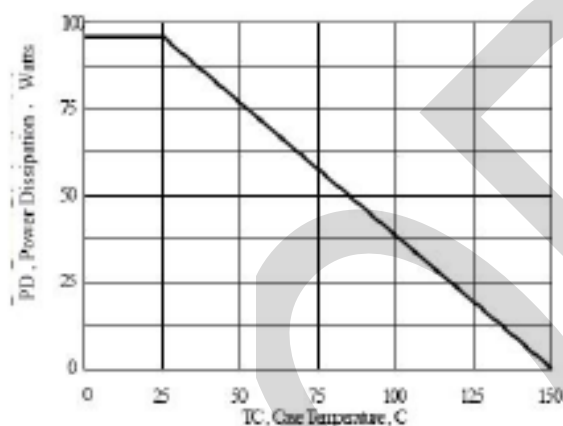


Figure 3. Maximum Continuous Drain Current vs Case Temperature

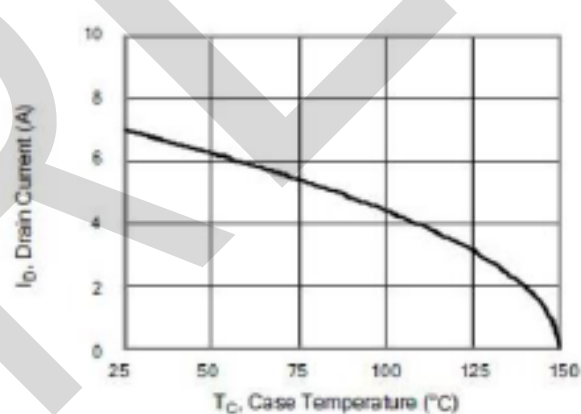


Figure 4. Typical Output Characteristics

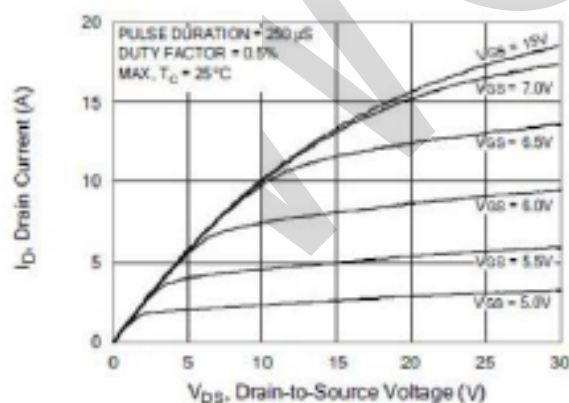
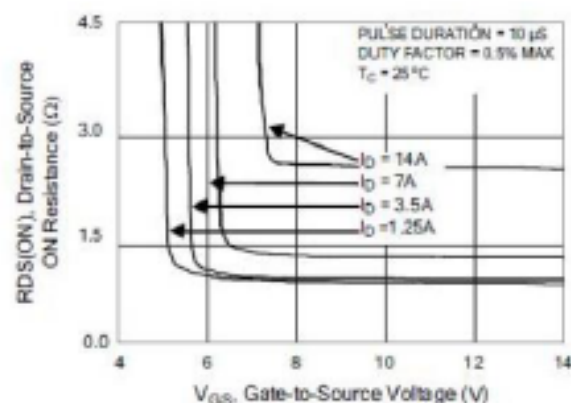


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current



Typical Characteristics

Figure 6. Maximum Peak Current Capability

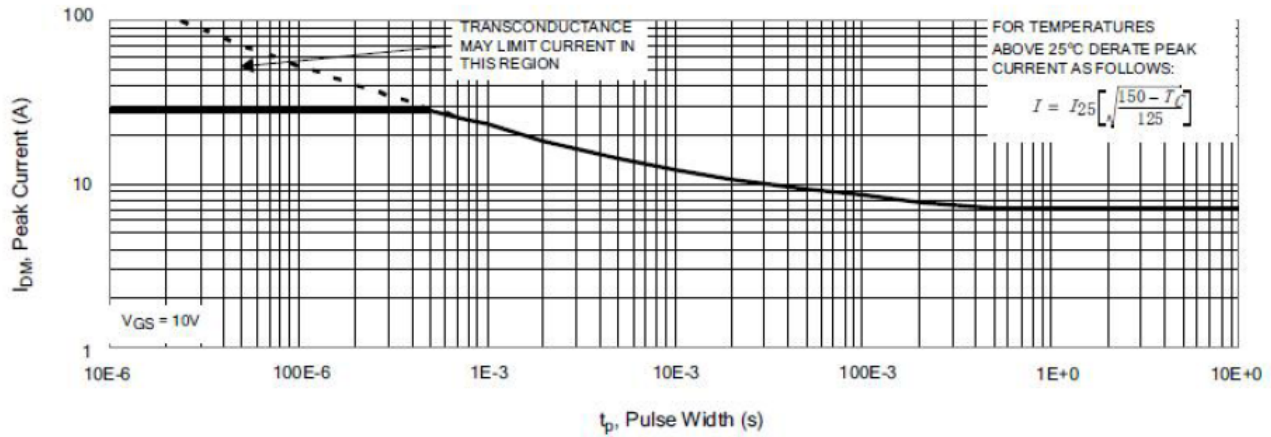


Figure 7. Typical Transfer Characteristics

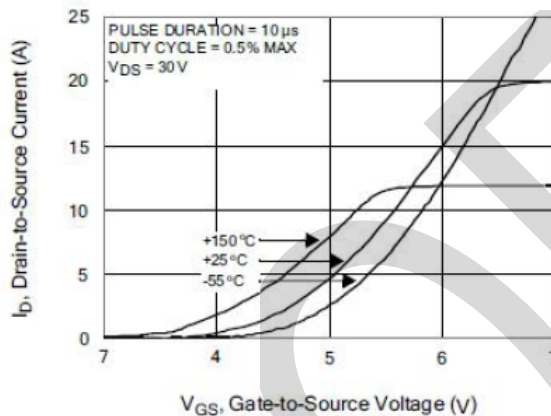


Figure 8. Unclamped Inductive Switching Capability

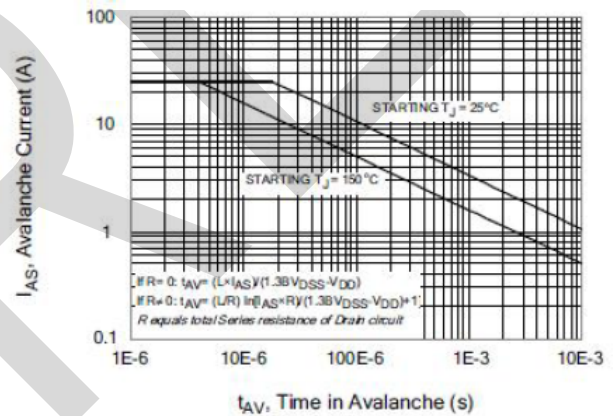


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

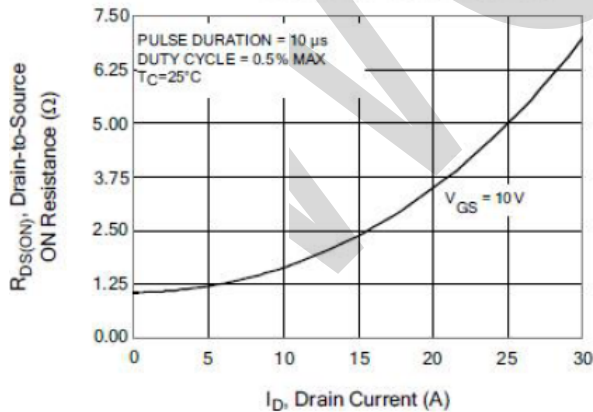
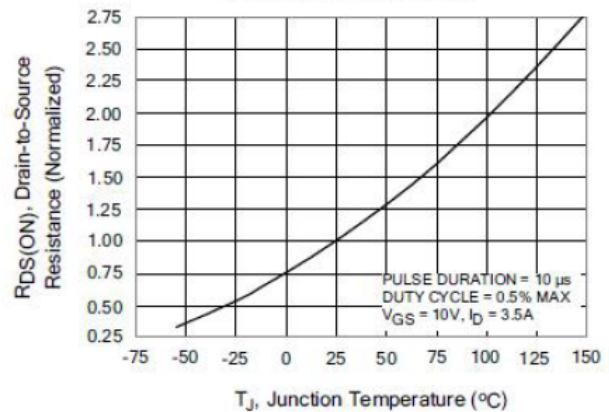


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature



Typical Characteristics

Figure 11. Typical Breakdown Voltage vs Junction Temperature

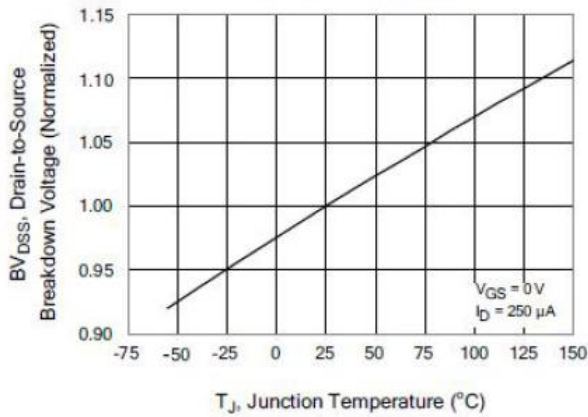


Figure 12. Typical Threshold Voltage vs Junction Temperature

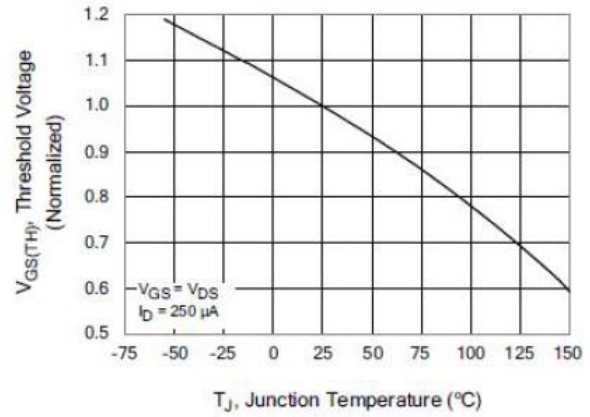


Figure 13. Maximum Forward Bias Safe Operating Area

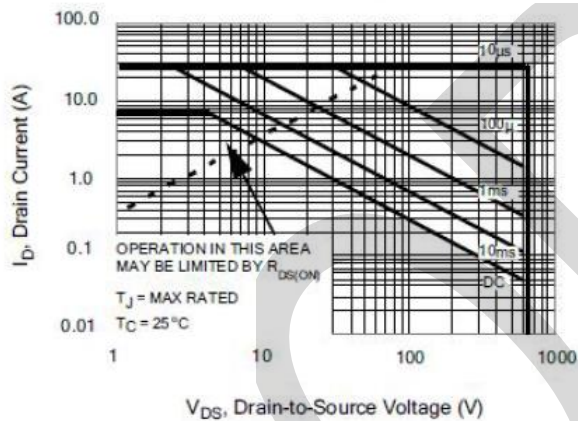


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

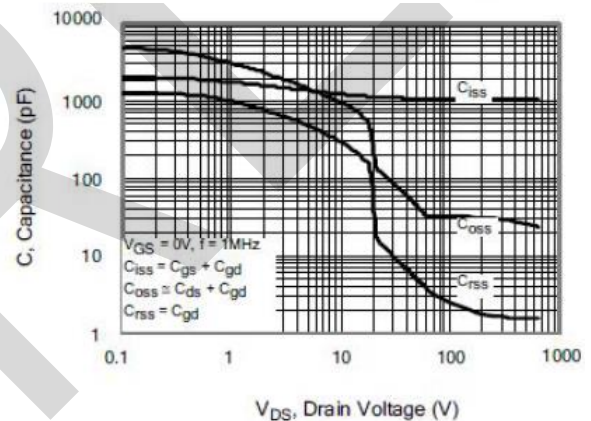


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

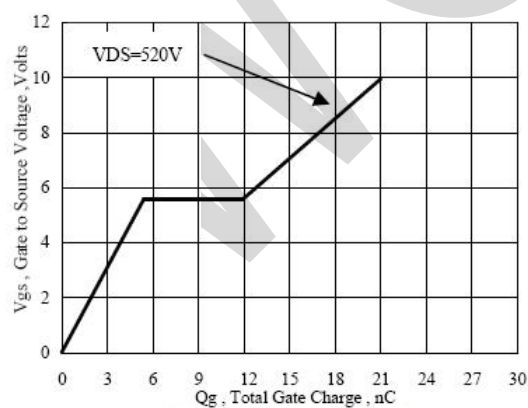
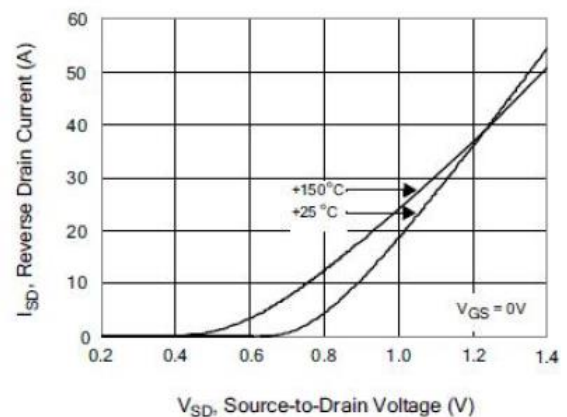


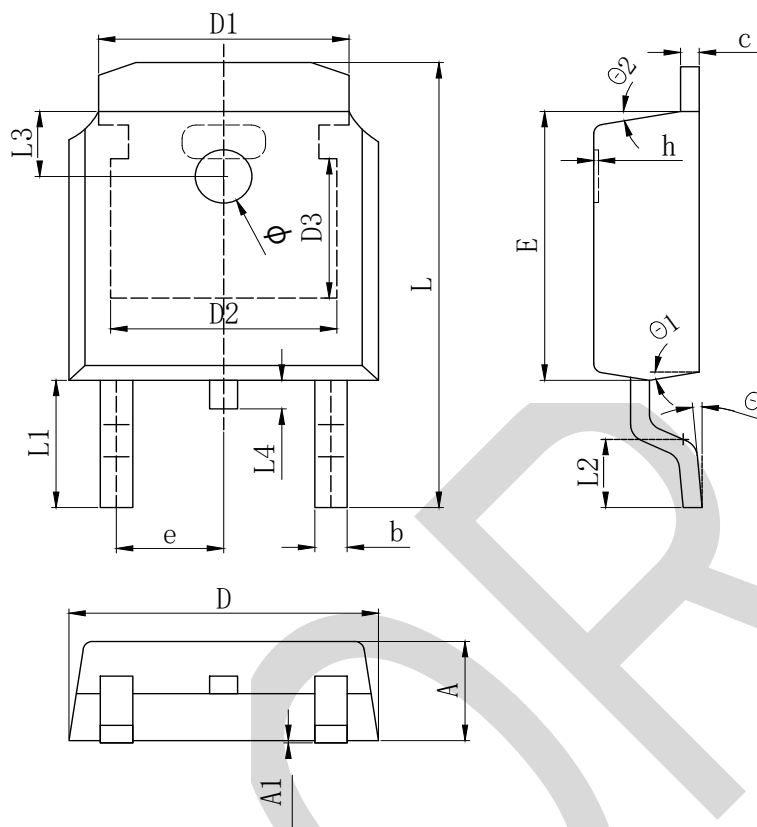
Figure 16. Typical Body Diode Transfer Characteristics



PACKAGE OUTLINE DIMENSIONS

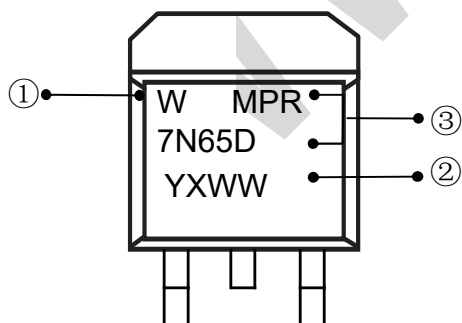
Note:unit mm

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ1	9° TYP		
θ2	9° TYP		

Marking Information



- ①W : Company's trademark
- ②Product model : MPR7N65D
- ③PDC information:

