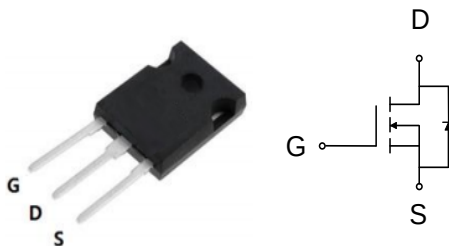


500V N-Channel MOSFET

MPR25N50PT

TO-247



Features

- Low gate charge
- 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	500	V
VGS	Gate-Source voltage	± 30	V
ID	Continuous drain current	25	A
IDM	Pulse drain current tested (Note 1)	100	A
EAS	Single Pulsed Avalanche Energy (Note 2)	477	mJ
PD	Power Dissipation	264	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.

(Note 2): L = 2.0mH, IAS = 20A, VDD = 50V, RG = 25 Ω , Starting TJ = 25 $^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	2.6	°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	500	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =500V, V _{GS} =0V	--	--	1	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 =10A	--	200	260	mΩ

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

C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	3682	--	pF
C _{oss}	Output Capacitance		--	357	--	pF
C _{rss}	Reverse Transfer Capacitance		--	17	--	pF
Q _g	Total Gate Charge	V _{DS} =400V, I _D =20A, V _{GS} =10V	--	74.5	--	nC
Q _{gs}	Gate-Source Charge		--	15	--	nC
Q _{gd}	Gate-Drain Charge		--	32.3	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V _{DD} =250V, I _D =20A, R _G =25Ω, T _J =25°C	--	41.5	--	ns
Tr	Turn-on Rise Time		--	43	--	ns
Td(off)	Turn-Off Delay Time		--	331.5	--	ns
Tf	Turn-Off Fall Time		--	91	--	ns

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

I _S	Maximum Continuous Drain to Source Diode Forward Current	--	--	25	A
I _{SM}	Pulsed Diode Forward Current	--	--	100	A
V _{SD}	Forward on voltage	I _{SD} =20A, V _{GS} =0V	--	--	1.4 V
T _{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V di/dt=100A/μs	--	525	ns
Q _{rr}	Reverse Recovery Charge		--	6.0	μC

Typical Characteristics

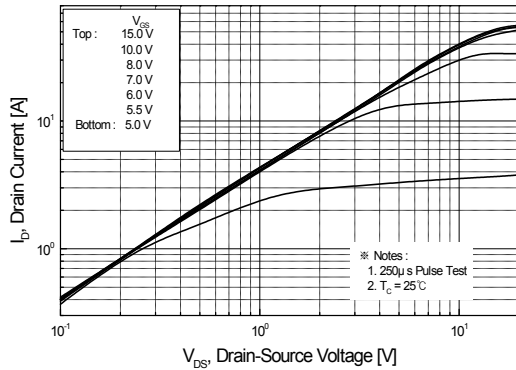


Figure 1. On-Region Characteristics

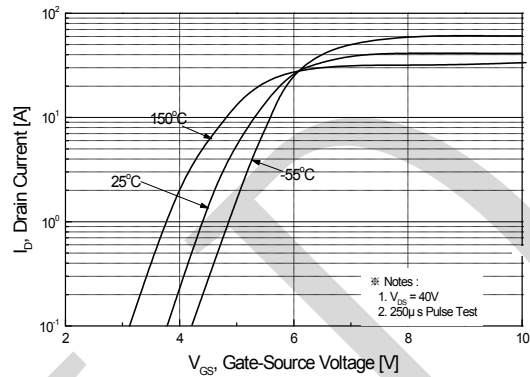


Figure 2. Transfer Characteristics

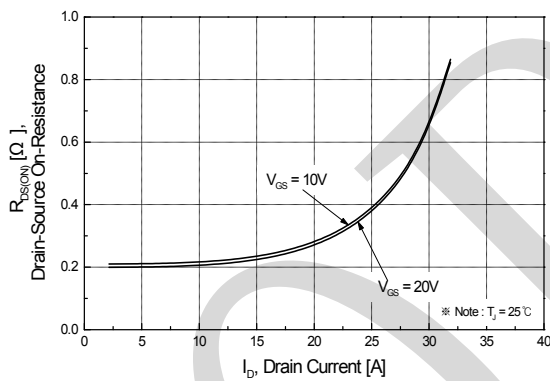


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

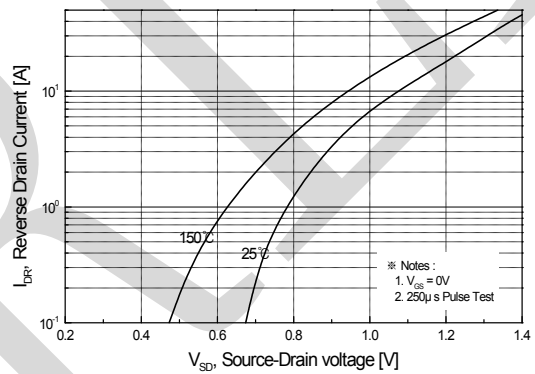


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

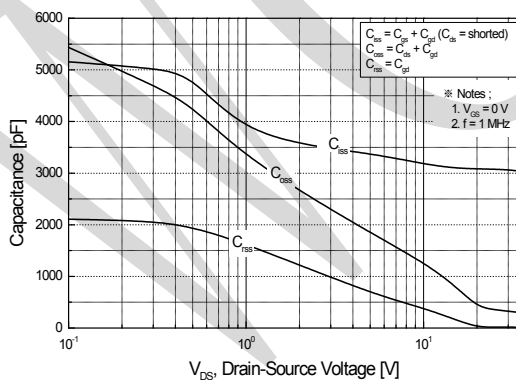


Figure 5. Capacitance Characteristics

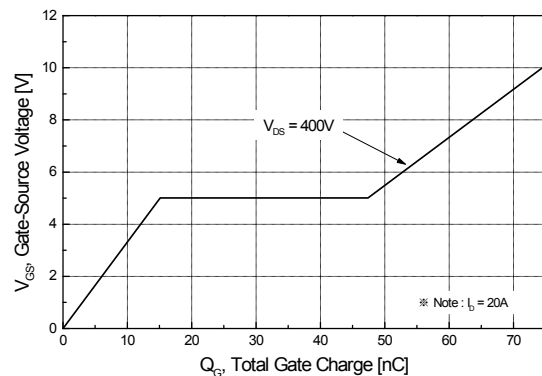


Figure 6. Gate Charge Characteristics

Typical Characteristics

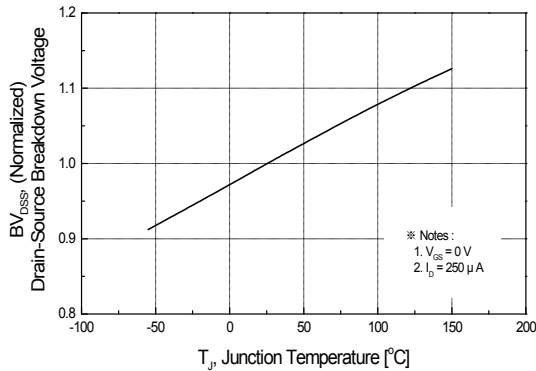


Figure 7. Breakdown Voltage Variation vs Temperature

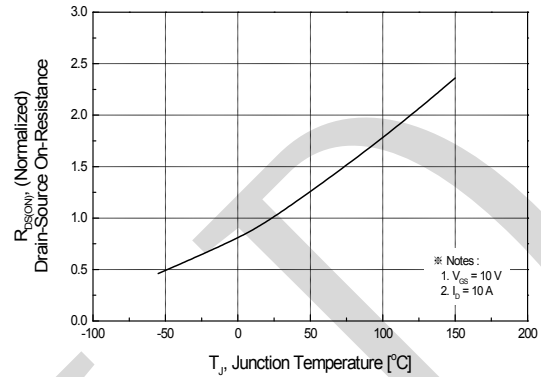


Figure 8. On-Resistance Variation vs Temperature

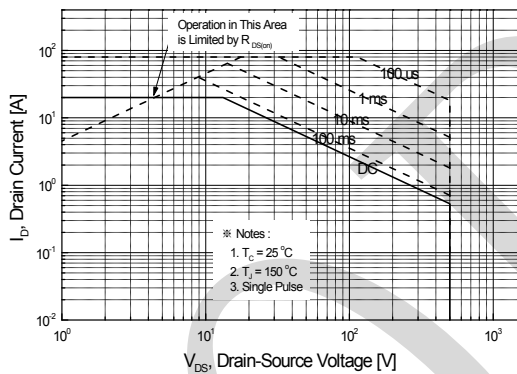


Figure 9-1. Maximum Safe Operating Area

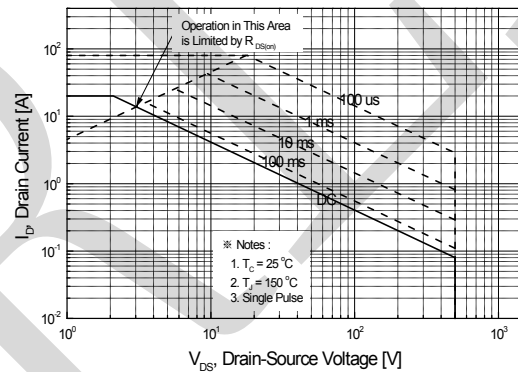


Figure 9-2. Maximum Safe Operating Area

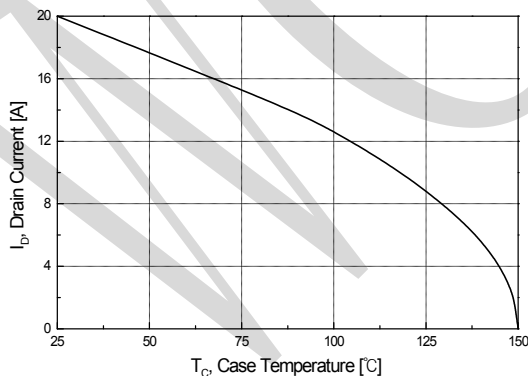


Figure 10. Maximum Drain Current vs Case Temperature

Typical Characteristics

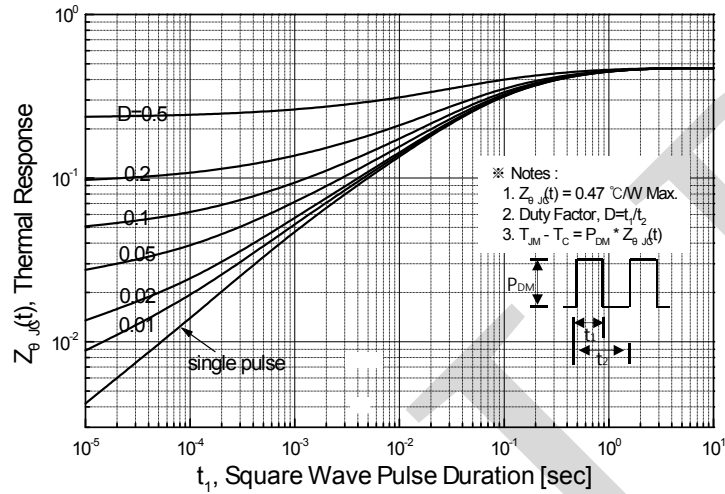


Figure 11-1. Transient Thermal Response Curve

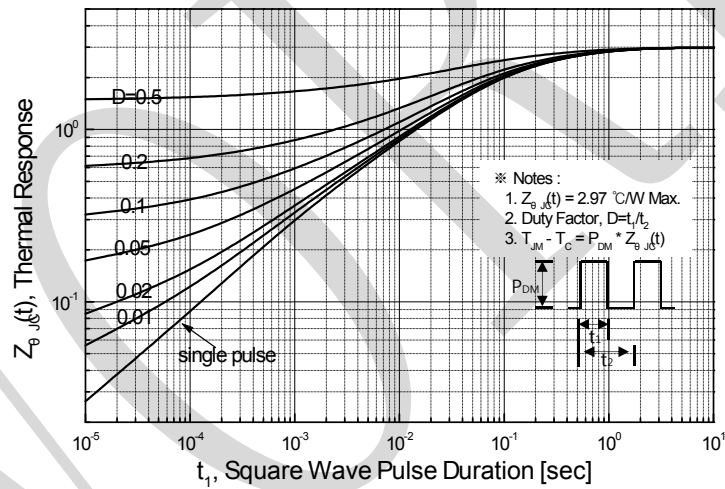
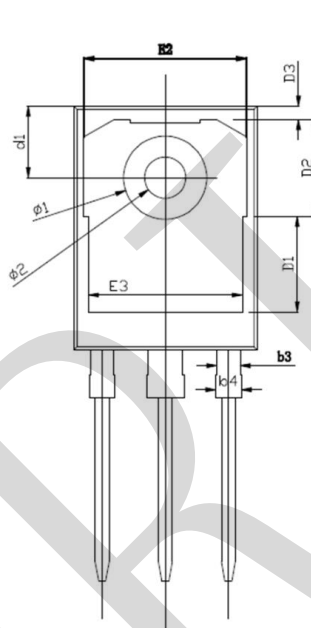
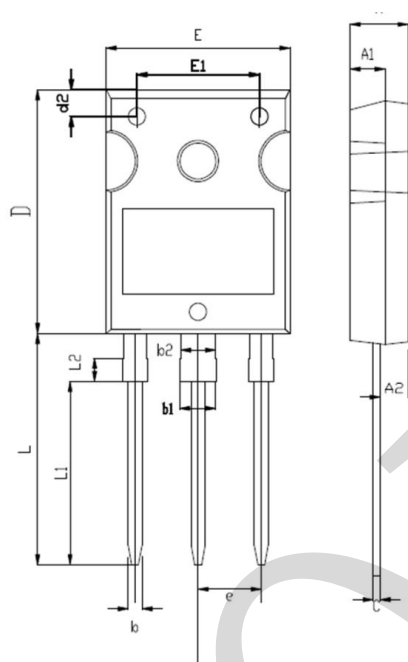


Figure 11-2. Transient Thermal Response Curve

PACKAGE OUTLINE DIMENSIONS

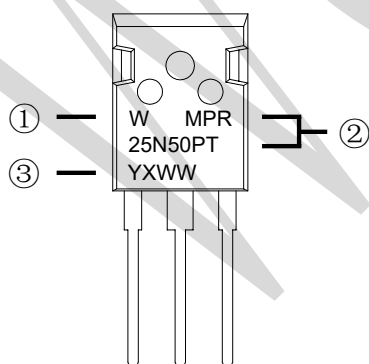
Note:unit mm

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	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.26	2.41	2.56
b	1.10	1.20	1.30
b1	2.90	-	3.20
b2	2.90	3.00	3.10
b3	1.90	2.00	2.10
b4	2.00	-	2.20
c	0.50	0.60	0.70
D	20.80	21.00	21.20
D1		8.23	
D2		8.32	
D3		1.17	
d1	6.00	6.15	6.30
d2	2.20	2.30	2.40
E	15.60	15.80	16.00
E1		10.50	
E2		14.02	
E3		13.50	
e	5.34	5.44	5.54
L	19.72	19.92	20.12
L1		15.79	
L2		1.98	
phi1	7.10	7.19	7.30
phi2	3.50	3.60	3.70

Marking Information



- ①W : Company's trademark
- ②Product model : MPR25N50PT
- ③PDC information:

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)