



PJZ20N50

500V N-Channel MOSFET

Voltage

500 V

Current

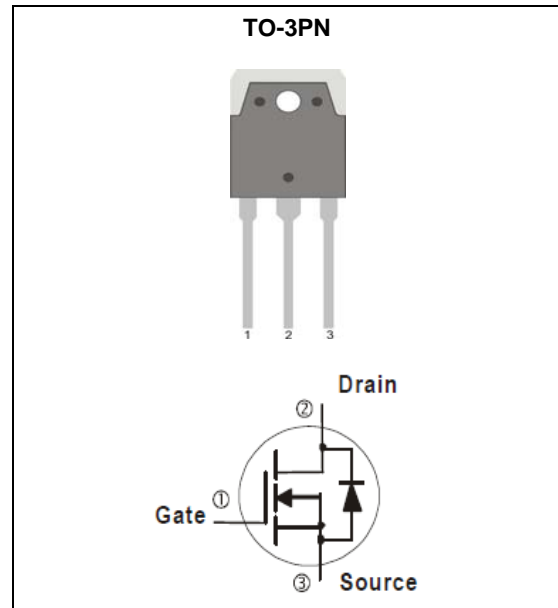
20 A

Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@10A < 0.3 \Omega$
- 100% avalanche tested
- Improved dv/dt capability
- Low Gate Charge
- Comply with EU RoHS 2011/65/EU only

Mechanical Data

- Case: TO-3PN Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Apporx. Weight : 0.182 ounces, 5.174 grams
- Marking : Z20N50



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS	
Drain-Source Voltage	V_{DS}	500	V	
Gate-Source Voltage	V_{GS}	+30	V	
Continuous Drain Current	I_D	20	A	
Pulsed Drain Current (Note 1)	I_{DM}	80	V	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	1088	mJ	
Repetitive Avalanche Current (Note 1)	I_{AR}	20	A	
Repetitive Avalanche Energy (Note 1)	E_{AR}	31.2	W	
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	312	W
		Derate above 25°C	2.5	W/ $^\circ\text{C}$
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$	
Thermal resistance				
- Junction to Case	$R_{\theta JC}$	0.4	$^\circ\text{C/W}$	
- Junction to Ambient	$R_{\theta JA}$	62.5		

- Limited only By Maximum Junction Temperature



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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	0.25	0.3	Ω
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=400V, T_C=125^\circ\text{C}$	-	-	10	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$	-	-	1.5	V
Forward Transconductance	$g_{FS(on)}$	$V_{DS}=30V, I_D=10A$	-	11	-	S
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=400V, I_D=20A,$ $V_{GS}=10V$ (Note 4,5)	-	54	-	nC
Gate-Source Charge	Q_{gs}		-	15	-	
Gate-Drain Charge	Q_{gd}		-	12.5	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHZ}$	-	3094	-	pF
Output Capacitance	C_{oss}		-	296	-	
Reverse Transfer Capacitance	C_{rss}		-	9.2	-	
Switching						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=250V, I_D=20A,$ $R_G=25\Omega$ (Note 4,5)	-	78	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	184	-	
Turn-On Rise Time	t_r		-	72	-	
Turn-Off Fall Time	t_f		-	68	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	20	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	-	-	80	A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=20A$	-	426	-	ns
Reverse Recovery Charge	Q_{rr}	$di_F/dt=100A/\mu s$ (Note 4)	-	6	-	μC

NOTES:

1. Repeated Rating: Pulse width limited by safe operating area
2. $L=4.9\text{mH}, I_{AS}=20A, V_{DD}=50V, R_G=25\text{ohm}$, Starting $T_J=25^\circ\text{C}$
3. $I_{SD}\leq 20A, di/dt\leq 200A/\mu s, V_{DD}< BV_{DS}$, Starting $T_J=25^\circ\text{C}$
4. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature typical characteristics.



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TYPICAL CHARACTERISTIC CURVES

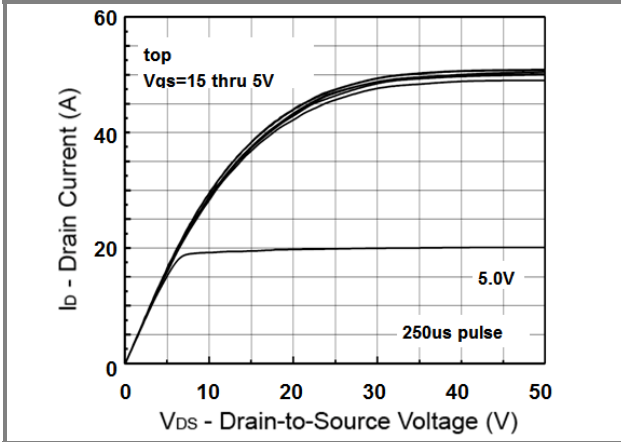


Fig.1 Output Characteristics

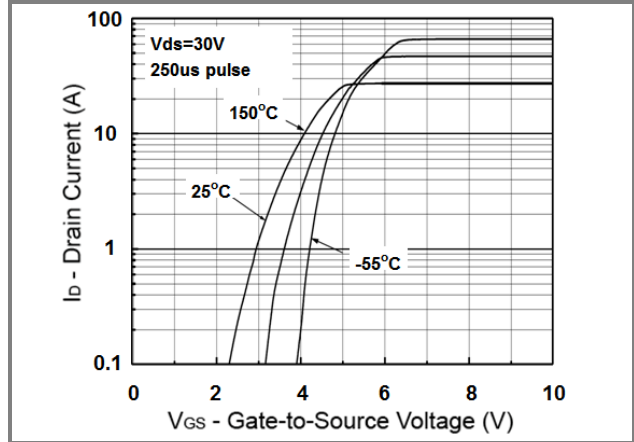


Fig.2 Transfer Characteristics

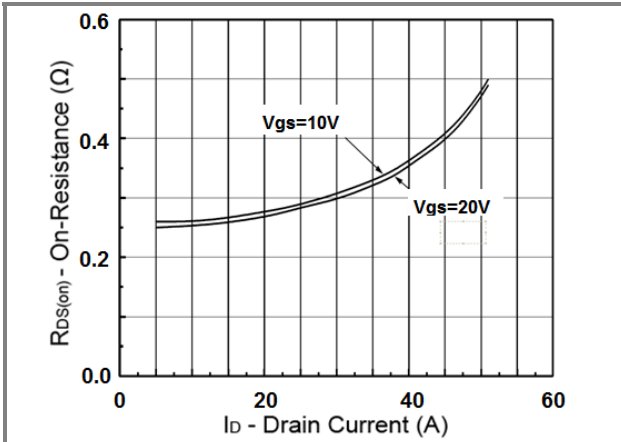


Fig.3 On-Resistance vs. Drain Current

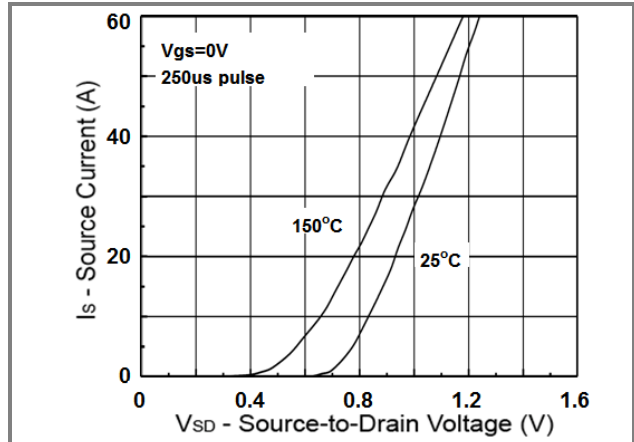


Fig.4 Source-Drain Diode Forward Voltage

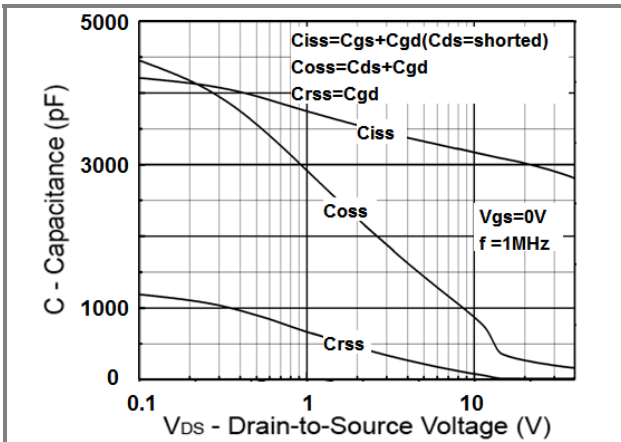


Fig.5 Capacitance vs. Drain-Source Voltage

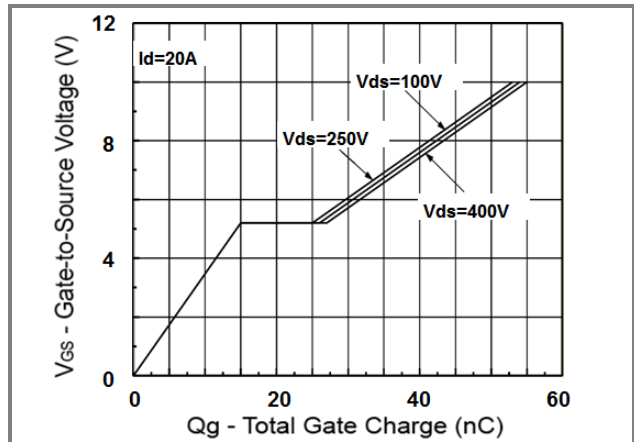


Fig.6 Gate Charge



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TYPICAL CHARACTERISTIC CURVES

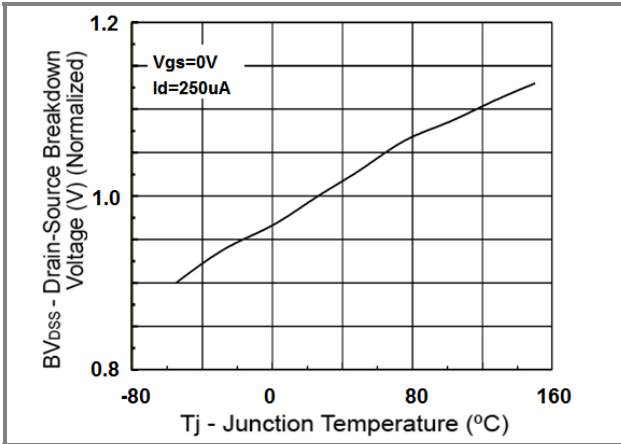


Fig.7 BV_{DSS} vs. Junction Temperature

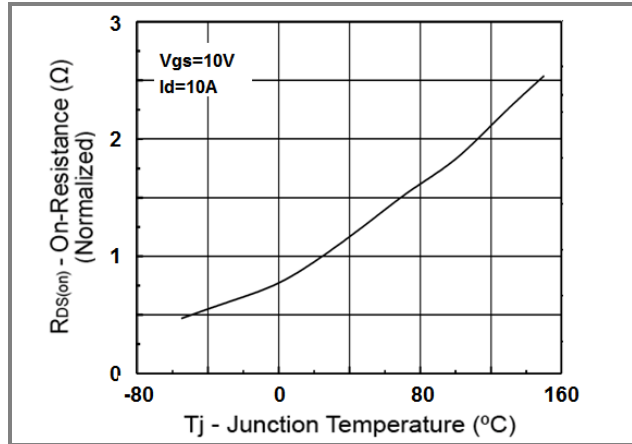


Fig.8 On-Resistance vs. Junction Temperature

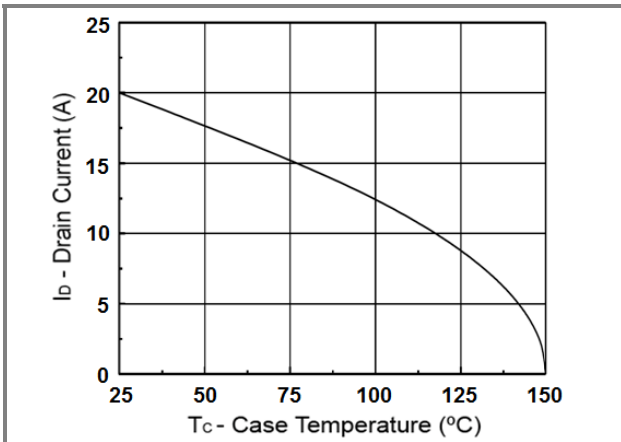


Fig.9 Drain Current vs. Case Temperature

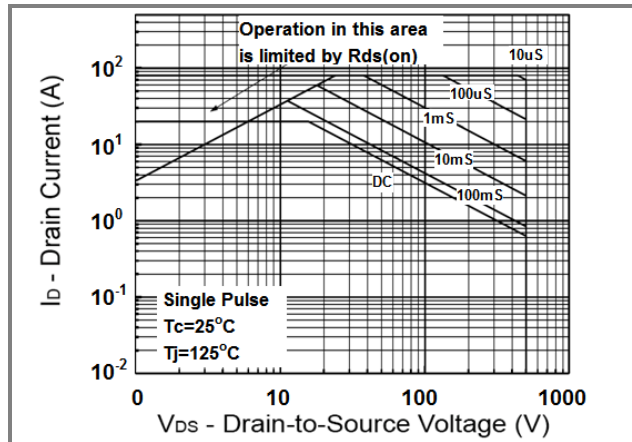


Fig.10 Maximum Safe Operating Area

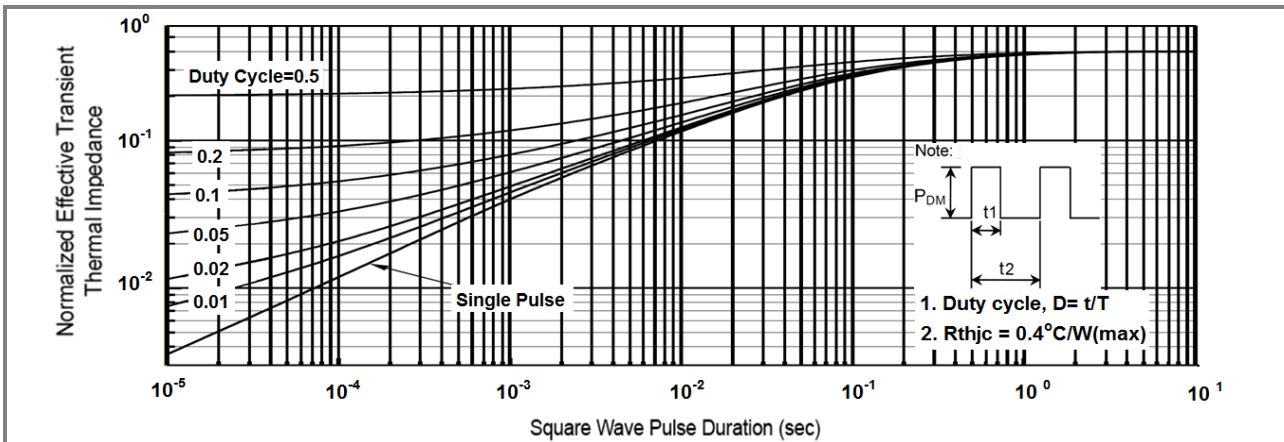
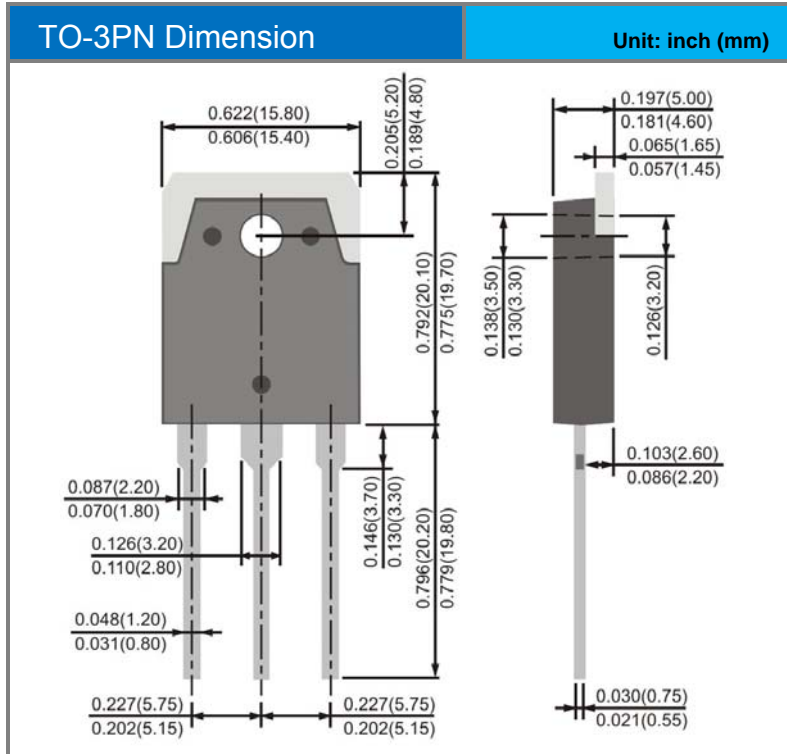


Fig.11 Normalized Thermal Transient Impedance, Junction to Ambient



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Packaging Information





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PART NO PACKING CODE VERSION

PART NO PACKING CODE VERSION	Package Type	Packing type	Marking	Version
PJZ20N50_TO_10001	TO-3PN	30pcs/tube	Z20N50	RoHS



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