Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
900V	1.93Ω@10V	6A

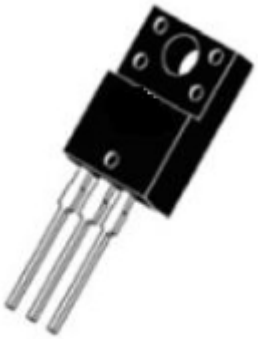
Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

Application

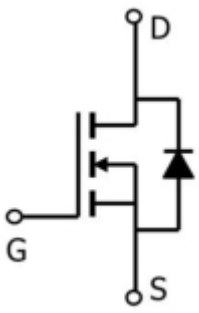
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

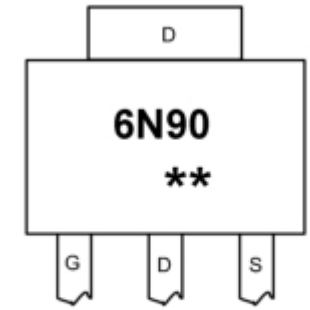


TO-220F(G:1 D:2 S:3)

Circuit diagram



Marking



6N90 =Device Code
** =Week Code

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current[1] (T_C =25℃)	I_D	6	A
Pulsed Drain Current[2]	I_{DM}	24	A
Single Pulse Avalanche Energy[3]	E_{AS}	526	mJ
Total Power Dissipation(T_C =25℃)	P_D	56	W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	2.23	℃/ W
Storage Temperature Range	T_{STG}	-55~ +150	℃
Operating Junction Temperature Range	T_J	-55~ +150	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS} = 0V, I_D =250μA	900			V
Bvdss Temperature Coefficient	ΔBVDSS/ΔTJ	I_D=250uA,Reference25 ℃		1.07		V/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS} =900V,V_{GS} = 0V T_J =25℃			1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS} =±30V, V_{DS} = 0V			±100	uA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3	4	5	V
Static Drain-Source on-Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =3A		2	2.4	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V, f=1MHz		1350		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			11		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=720V, V_{GS}=10V, I_D=6A		30		nC
Gate-Source Charge	Q_{gS}			9		
Gate-Drain Charge	Q_{gd}			12		
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=450V, V_{GS}=10V, R_G=2.5Ω, I_D=6A		36		nS
Rise Time	T_r			90		
Turn-Off Delay Time	$T_{d(off)}$			54		
Fall Time	T_f			61		

Notes:

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is R G =25Ω ,L=34mH

Typical Characteristics

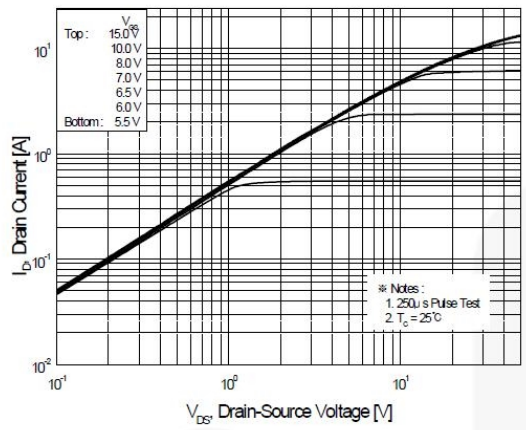


Figure 1. On-Region Characteristics

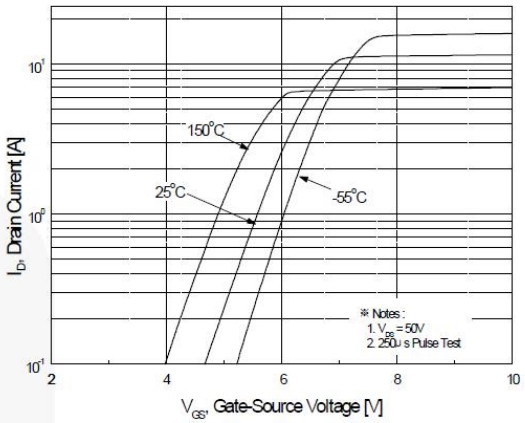


Figure 2. Transfer Characteristics

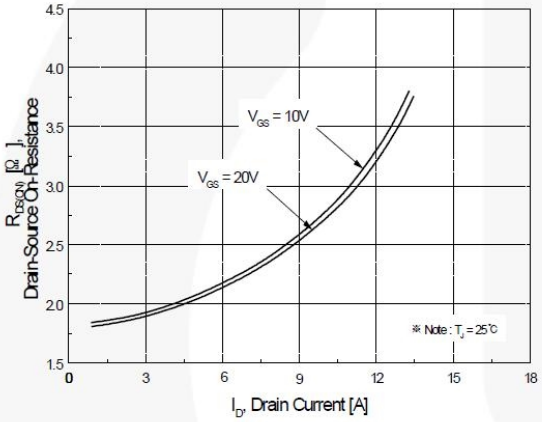


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

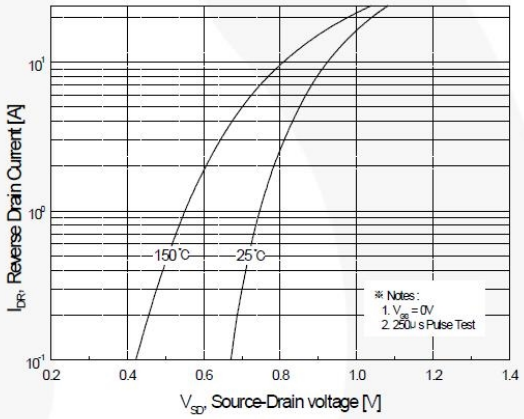


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

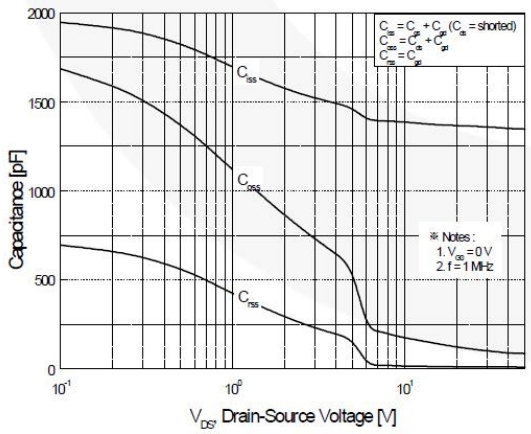


Figure 5. Capacitance Characteristics

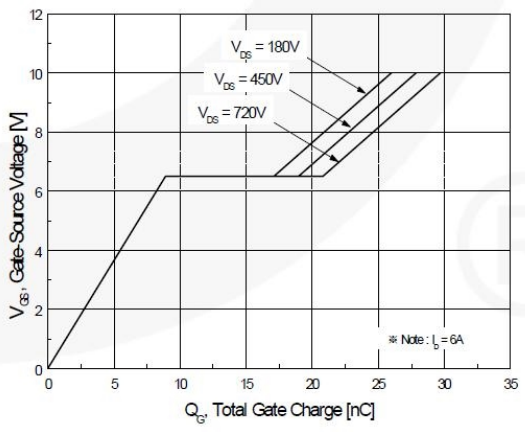


Figure 6. Gate Charge Characteristics

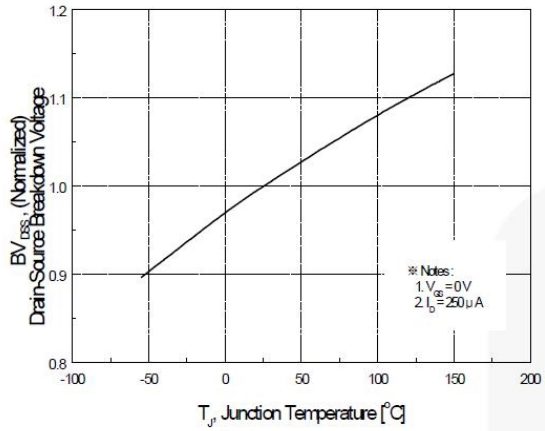


Figure 7. Breakdown Voltage Variation vs Temperature

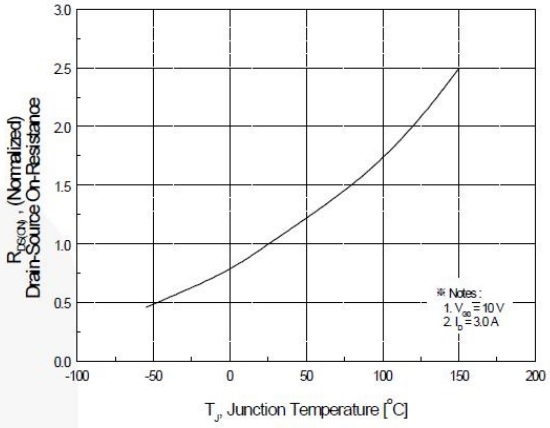


Figure 8. On-Resistance Variation vs Temperature

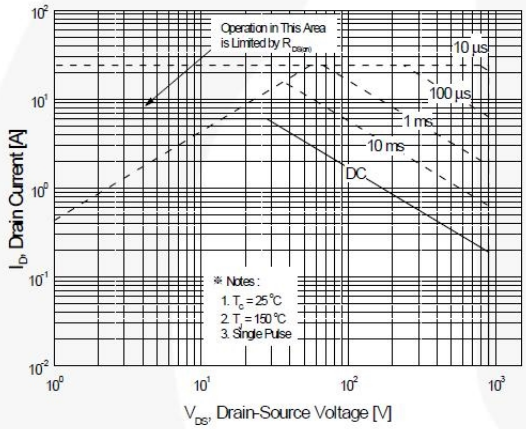


Figure 9-1. Maximum Safe Operating Area for FQP6N90C

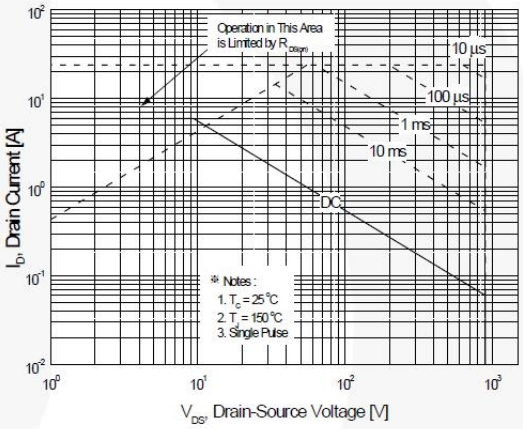


Figure 9-2. Maximum Safe Operating Area for FQPF6N90C

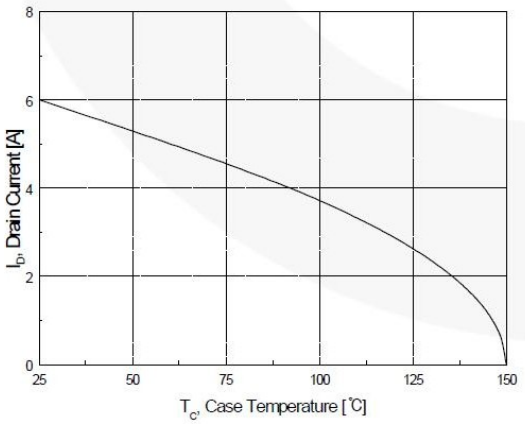


Figure 10. Maximum Drain Current vs Case Temperature

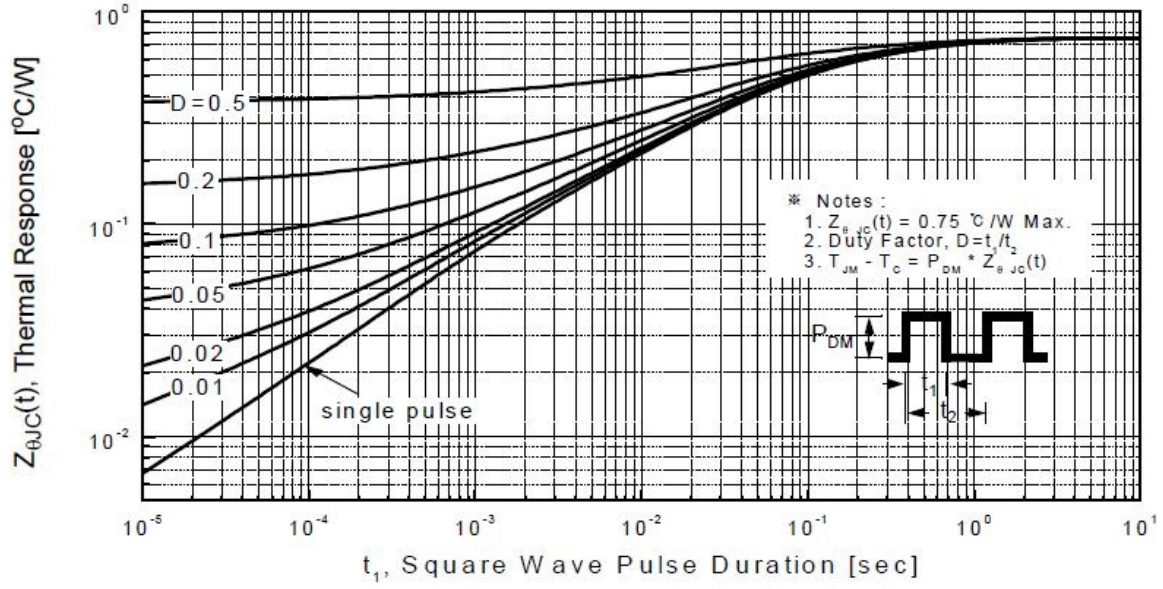


Figure 11-1. Transient Thermal Response Curve for FQP6N90C

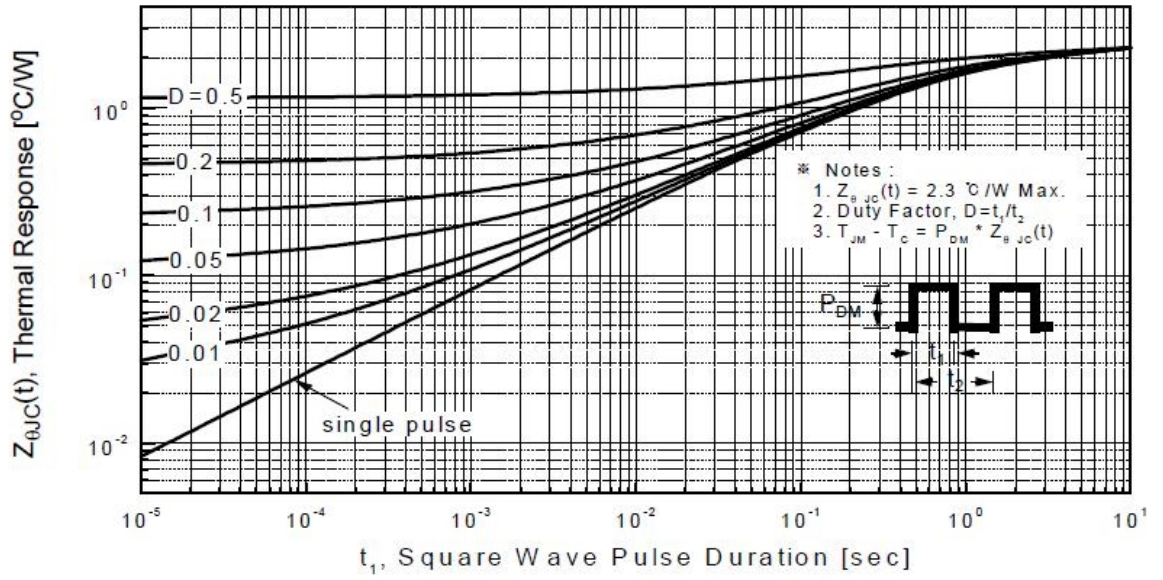
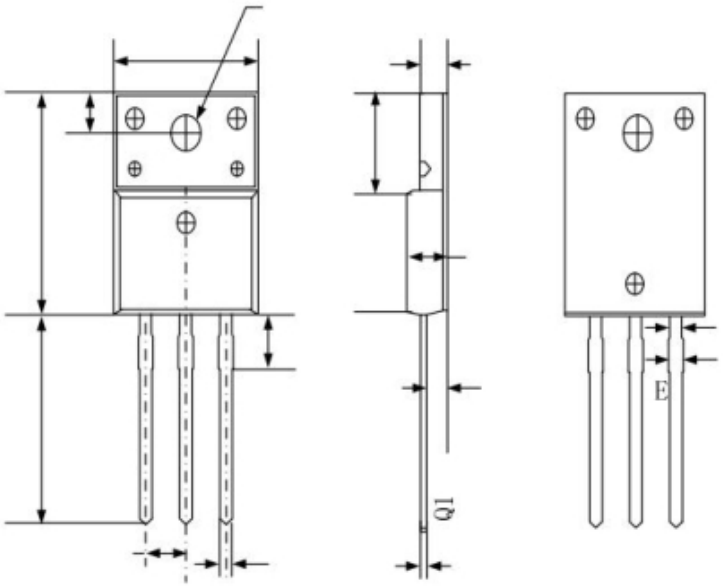


Figure 11-2. Transient Thermal Response Curve for FQPF6N90C

TO-220F Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.83	0.18	0.19
b	0.70	0.91	0.03	0.04
b1	1.20	1.47	0.05	0.06
b2	1.10	1.38	0.04	0.05
c	0.45	0.63	0.02	0.02
D	15.67	16.07	0.62	0.63
e	2.54 BSC		0.10 BSC	
E	9.96	10.36	0.39	0.41
F	2.34	2.74	0.09	0.11
G	6.48	6.90	0.26	0.27
L	12.68	13.30	0.50	0.52
L1	3.13	3.50	0.12	0.14
Q	2.56	2.93	0.10	0.12
Q1	3.20	3.40	0.13	0.13
ΦR	3.08	3.28	0.12	0.13