

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
900V	$3.6\Omega@10V$	4A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$

Applications

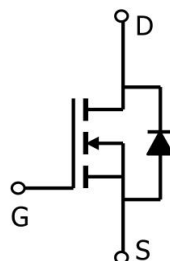
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

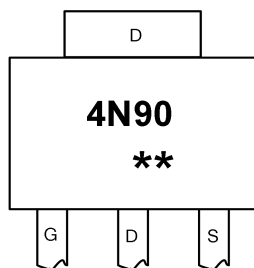


TO-220F(1:G 2:D 3:S)

Circuit diagram



Marking



4N90
**

:Product code
:Week code

Order Information

Device	Package	Unit/Tube
SP4N90TG	TO-220F	50

Absolute maximum ratings (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current (Tc=25°C)	I_D	4	A
Continuous Drain Current (Tc=100°C)	I_D	2.6	A
Pulsed Drain Current	I_{DM}	16	A
Power Dissipation (Tc=25°C)	P_D	35	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	3.57	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$ID = 250\mu A, VGS = 0V$	900	-	-	V
Drain Cut-Off Current	$IDSS$	$VDS = 720V, VGS = 0V$	-	-	25	μA
Gate Leakage Current	$IGSS$	$VGS = \pm 30V, VDS = 0V$	-	-	± 0.1	
Gate Threshold Voltage	$VGS(th)$	$VDS = VGS, ID = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$RDS(ON)$	$VGS = 10V, ID = 3A$	-	3.6	4.8	Ω
Dynamic Characteristics						
Input Capacitance	$Ciss$	$VDS = 25V, VGS = 0V, f = 1.0MHz$	-	850	-	pF
Output Capacitance	$Coss$		-	75	-	
Reverse Transfer Capacitance	$Crss$		-	11	-	
Total Gate Charge	Qg	$VDS=720V, VGS=10V, ID=70A$	-	30	-	nC
Gate-Source Charge	Qgs		-	5	-	
Gate-Drain Charge	Qgd		-	12	-	
Switching Characteristics						
Turn-On Delay Time	$td(on)$	$VGS = 450V, VDS = 25V, ID = 4A$ $RG = 2.5\Omega$	-	16	-	nS
Rise Time	tr		-	17	-	
Turn-Off Delay Time	$td(off)$		-	44	-	
Fall Time	tf		-	15	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	$Is = 1A, VGS = 0V$	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	4	A
Body Diode Reverse Recovery Time	Trr	$Is=4A, di/dt=100A/us, TJ=25^{\circ}C$	-	385	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	1795	-	nC

Typical Characteristics

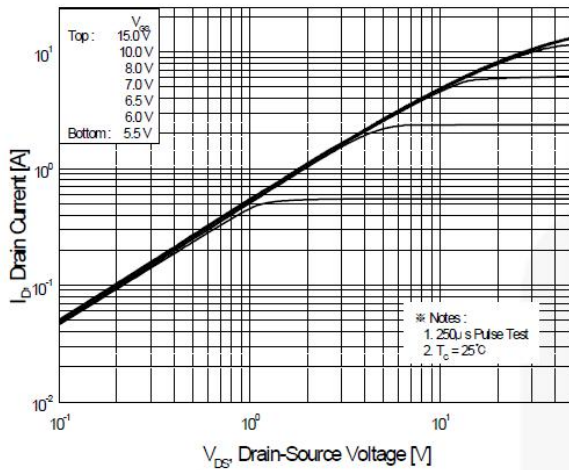


Figure 1. On-Region Characteristics

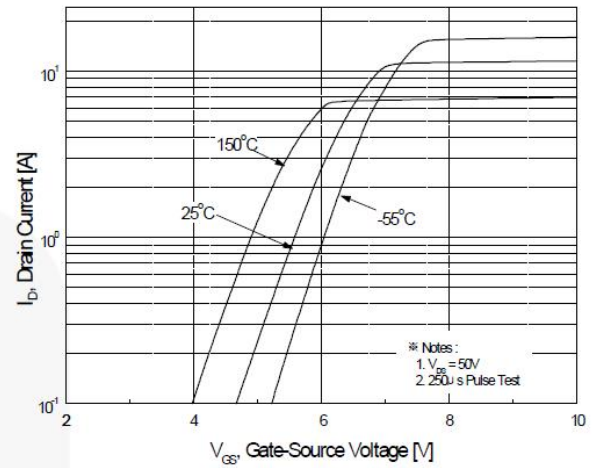


Figure 2. Transfer Characteristics

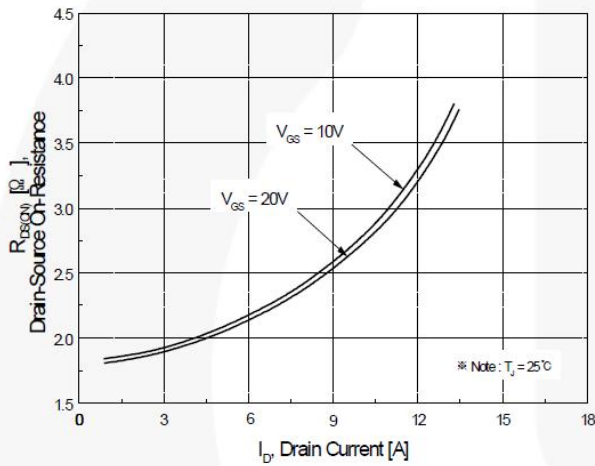


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

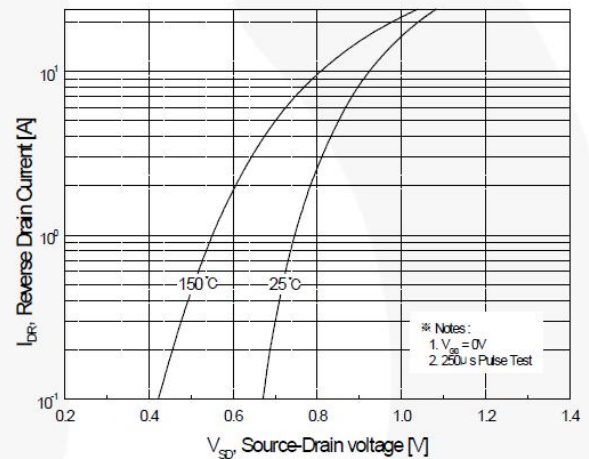


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

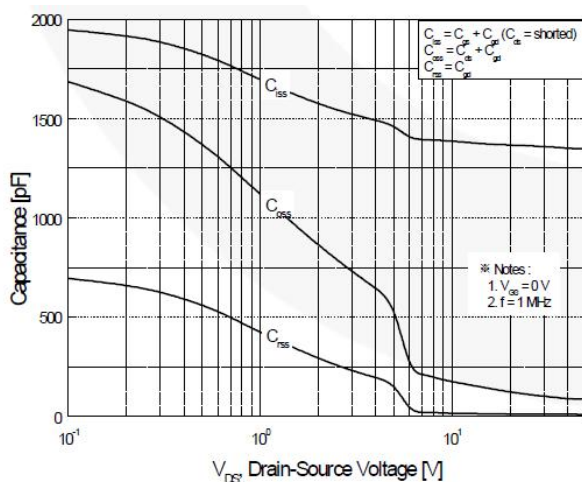


Figure 5. Capacitance Characteristics

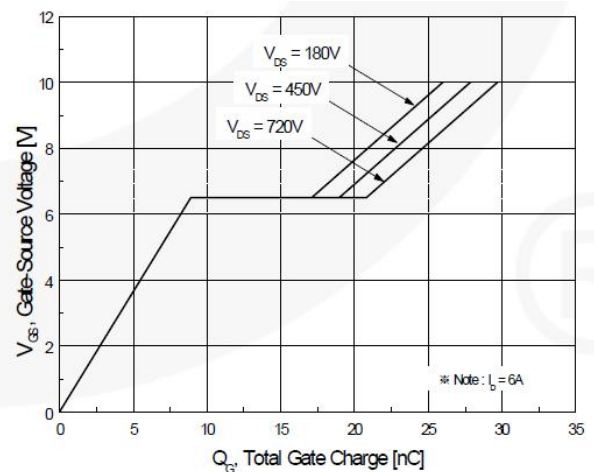


Figure 6. Gate Charge Characteristics

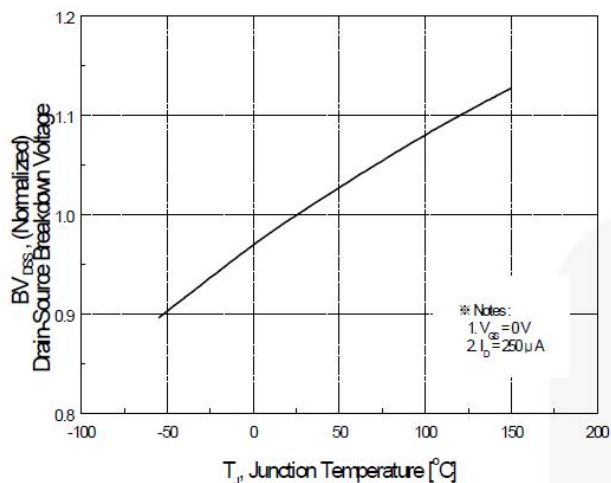


Figure 7. Breakdown Voltage Variation vs Temperature

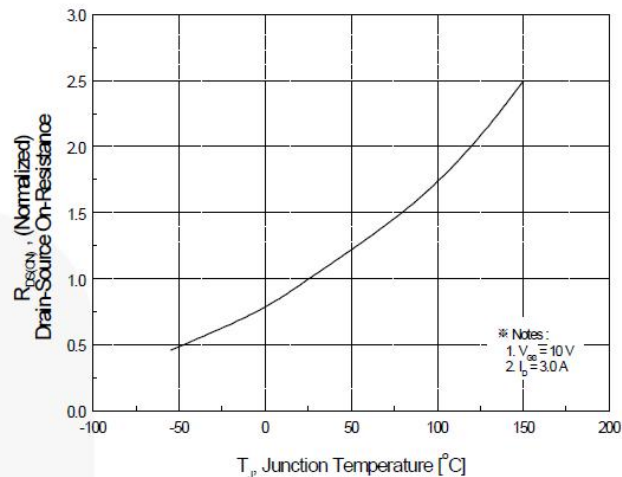


Figure 8. On-Resistance Variation vs Temperature

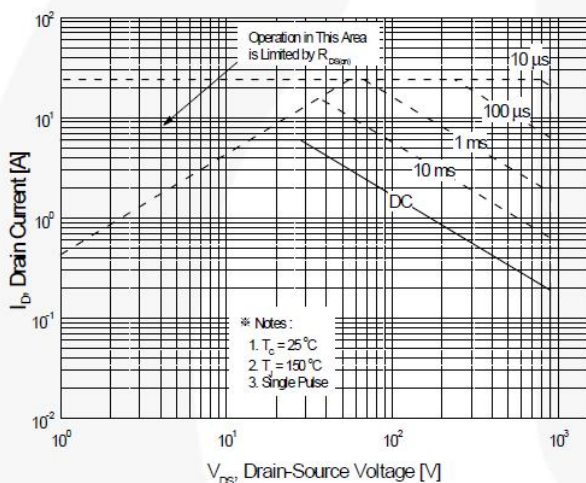


Figure 9-1. Maximum Safe Operating Area for FQP6N90C

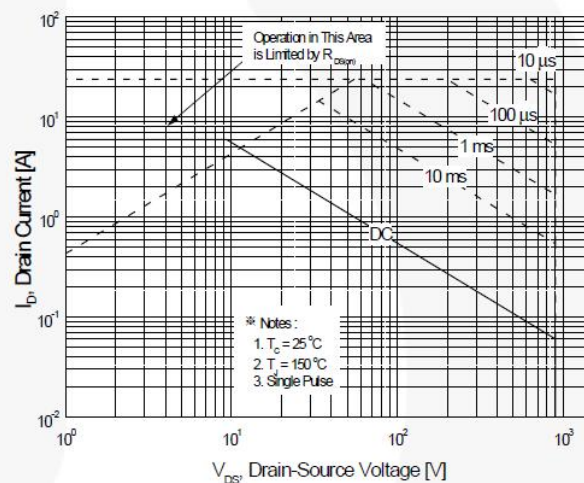


Figure 9-2. Maximum Safe Operating Area for FQPF6N90C

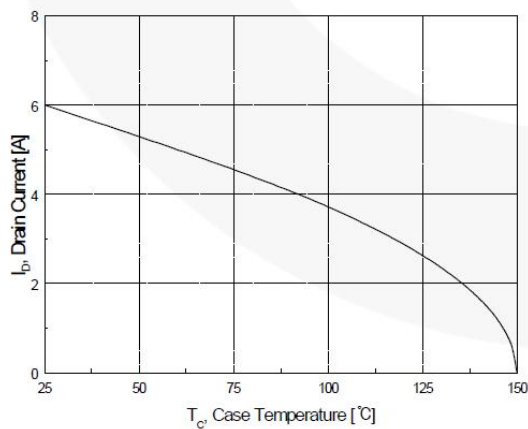


Figure 10. Maximum Drain Current vs Case Temperature

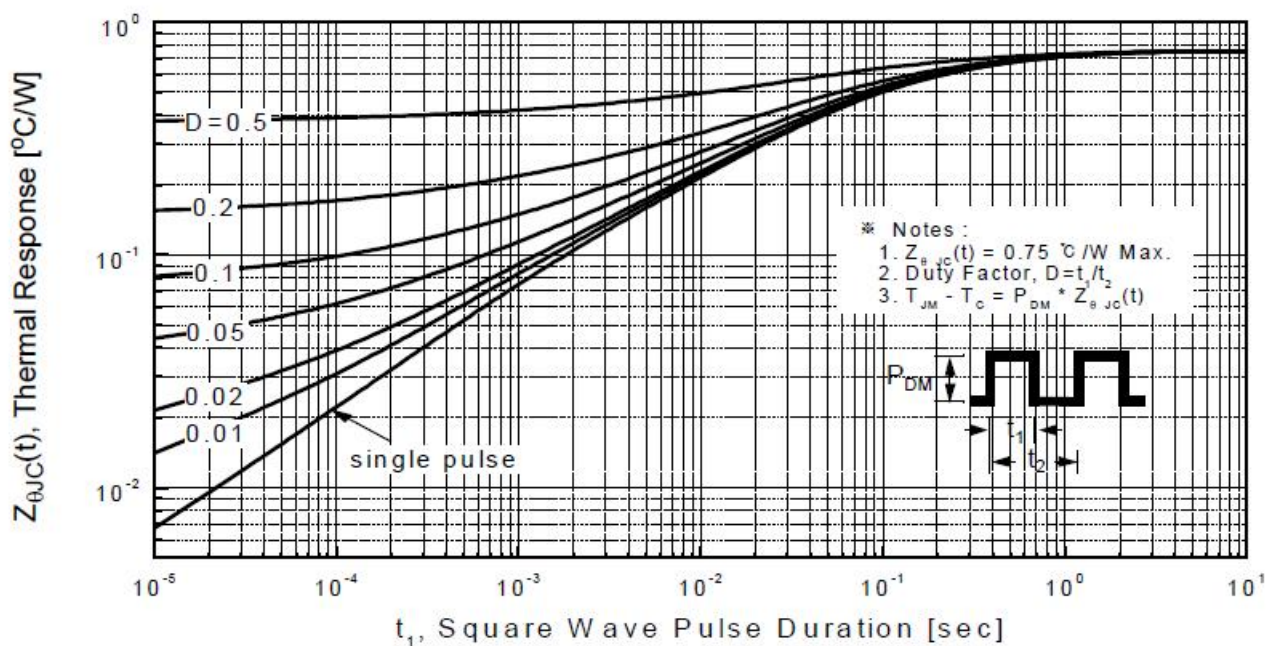


Figure 11-1. Transient Thermal Response Curve for FQP6N90C

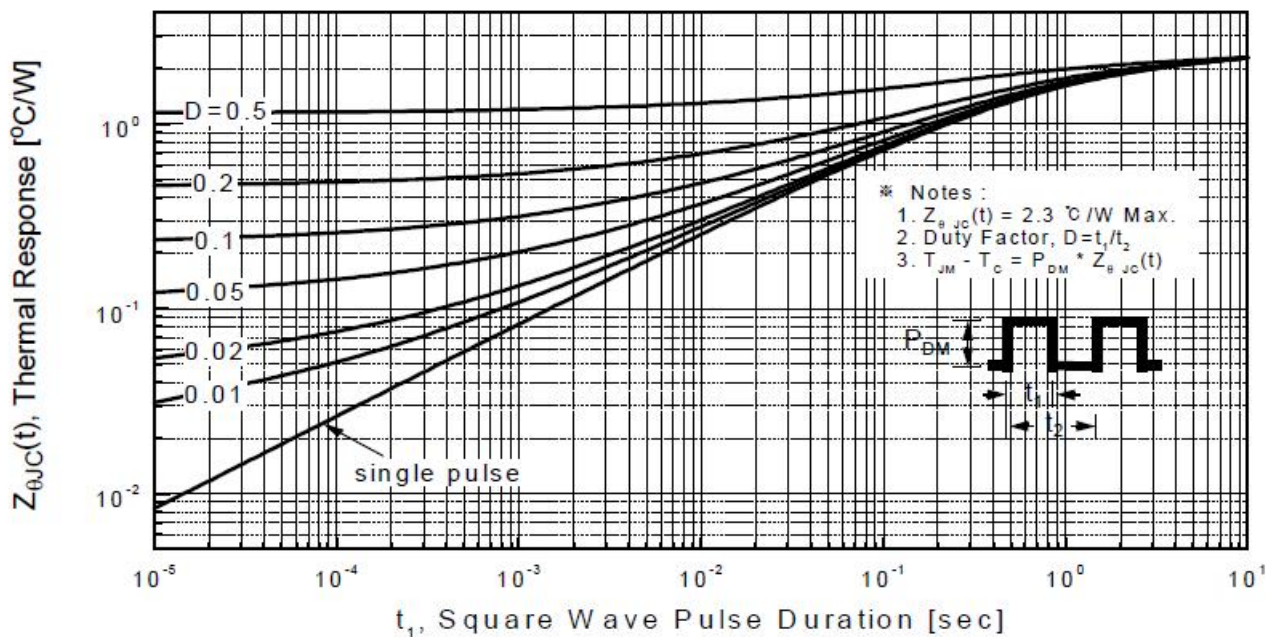
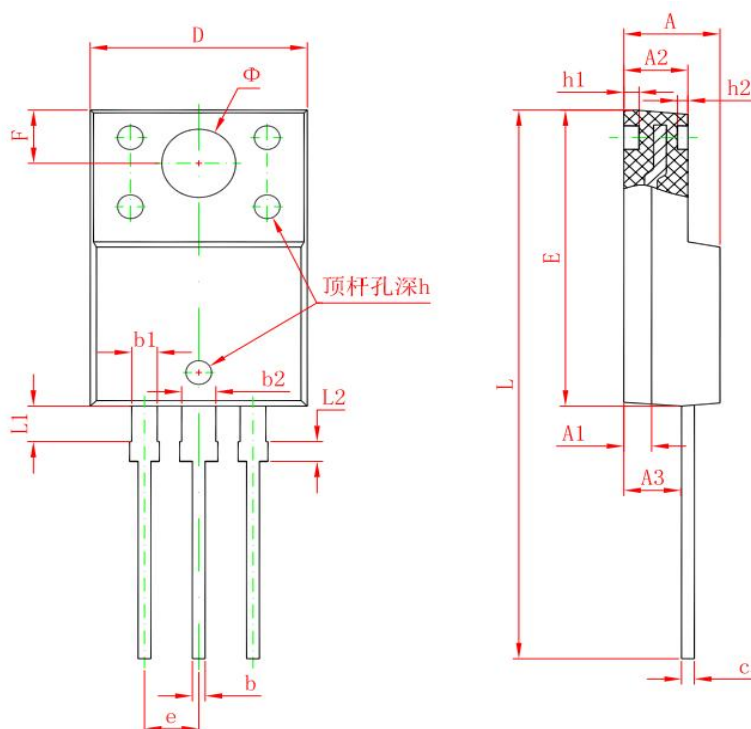


Figure 11-2. Transient Thermal Response Curve for FQPF6N90C

TO-220F Package Information


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.300	4.700
A1	1.300 REF.	
A2	2.800	3.200
A3	2.500	2.900
b	0.500	0.750
b1	1.100	1.350
b2	1.500	1.750
c	0.500	0.750
D	9.960	10.360
E	14.800	15.200
e	2.540 TYP.	
F	2.700 REF.	
Φ	3.500 REF.	
h	0.000	0.300
h1	0.800 REF.	
h2	0.500 REF.	
L	28.000	28.400
L1	1.700	1.900
L2	0.900	1.100