

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
900V	$0.7\Omega@10V$	12A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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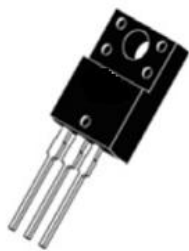
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- 100% Single Pulse avalanche energy Test

Applications

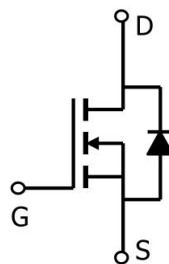
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

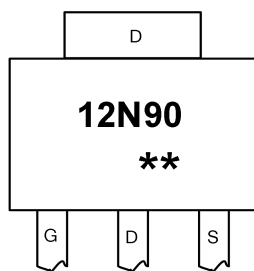


TO-220F(1:G 2:D 3:S)

Circuit diagram



Marking



12N90
**

:Product code
:Week code

Order Information

Device	Package	Unit/Tube
SP12N90TG	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	12	A
Continuous Drain Current (Tc=100°C)	I_D	8	A
Pulsed Drain Current	I_{DM}	48	A
Single Pulse Avalanche Energy ¹	E_{AS}	1805	mJ
Power Dissipation (Tc=25°C)	P_D	230	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.54	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

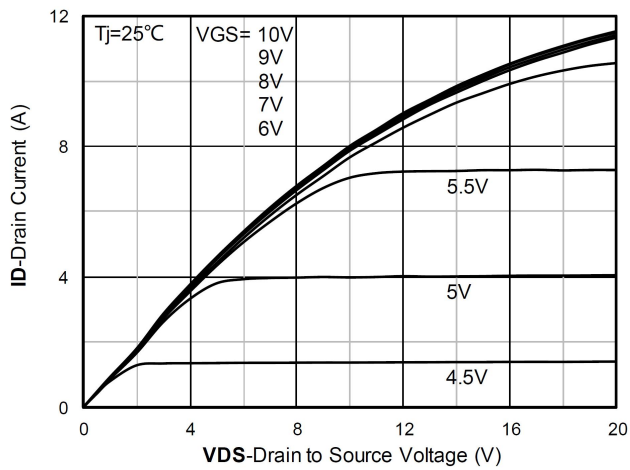
Electrical characteristics (Ta=25°C, unless otherwise noted)

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	$V_{GS(th)}$	$VDS = VGS, ID = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$VGS = 10V, ID = 6A$	-	0.7	0.9	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$VDS = 25V, VGS = 0V, f = 1.0MHz$	-	4713	-	pF
Output Capacitance	C_{oss}		-	278	-	
Reverse Transfer Capacitance	C_{rss}		-	5	-	
Total Gate Charge	Q_g	$VDS=720V, VGS=10V, ID=12A$	-	87	-	nC
Gate-Source Charge	Q_{gs}		-	27	-	
Gate-Drain Charge	Q_{gd}		-	31	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$VGS = 450V, VDS = 25V, ID = 12A$ $RG = 25\Omega$	-	52	-	nS
Rise Time	t_r		-	59	-	
Turn-Off Delay Time	$t_{d(off)}$		-	90	-	
Fall Time	t_f		-	48	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	$I_s = 1A, VGS = 0V$	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_s		-	-	12	A
Body Diode Reverse Recovery Time	T_{rr}	$I_s=12A, di/dt=100A/us, T_J=25^{\circ}C$	-	945	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	13.5	-	μC

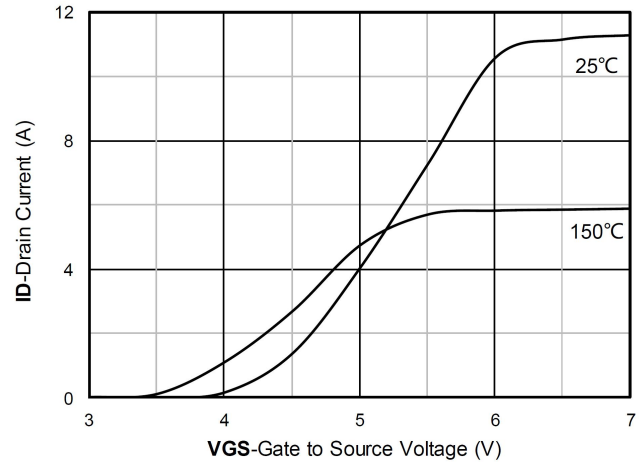
Note :

1. The test condition is $V_{DD} = 80V, V_{GS} = 10V, L = 10mH, R_G = 25\Omega$

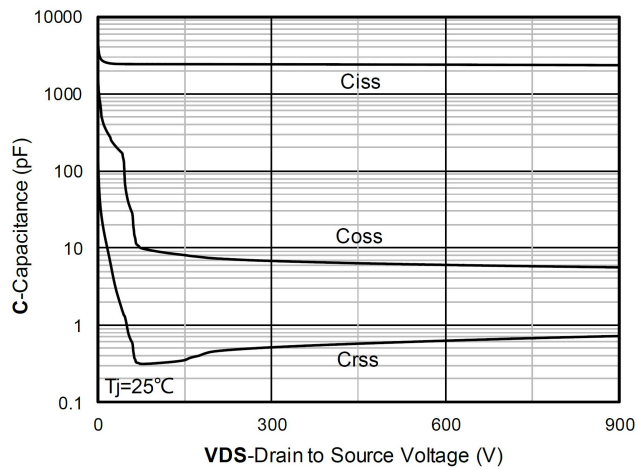
Typical Characteristics



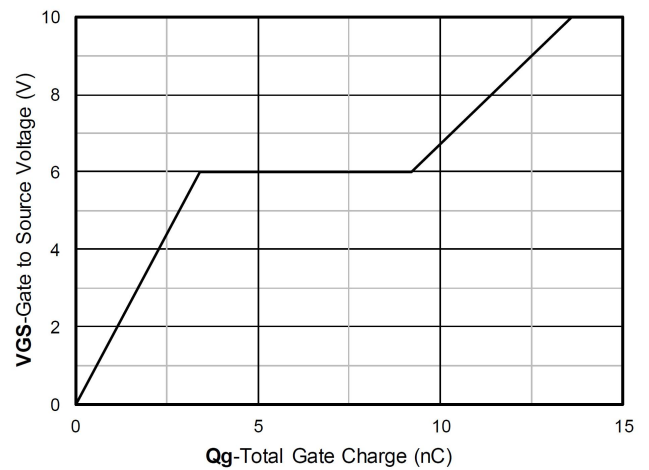
Output Characteristics



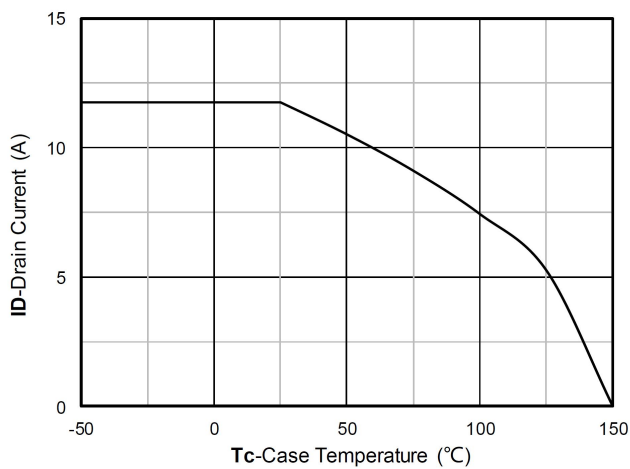
Transfer Characteristics



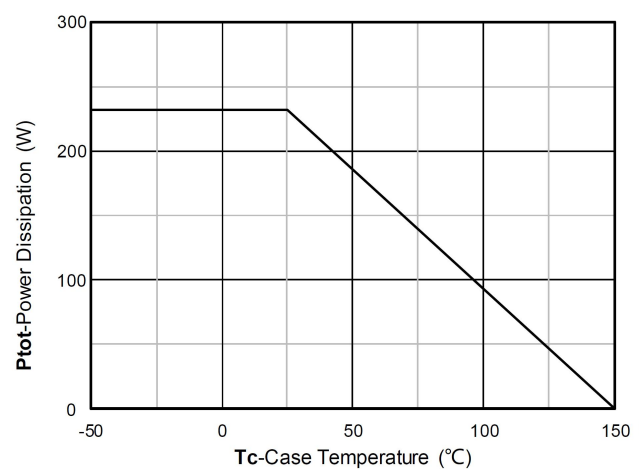
Capacitance Characteristics



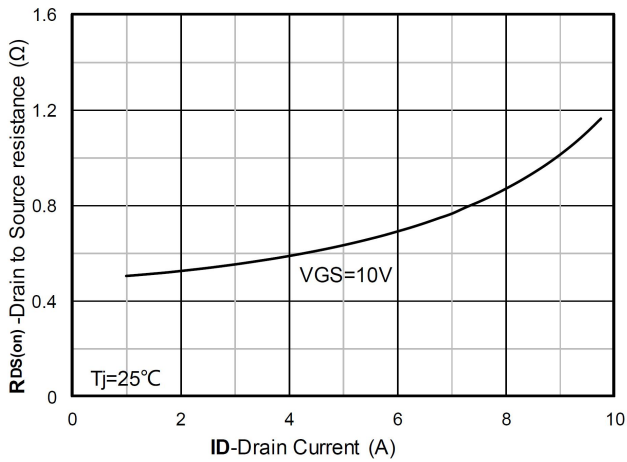
Gate Charge



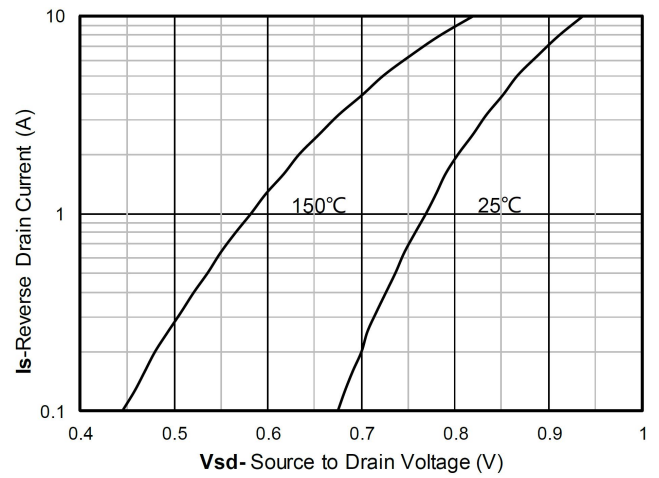
Current dissipation



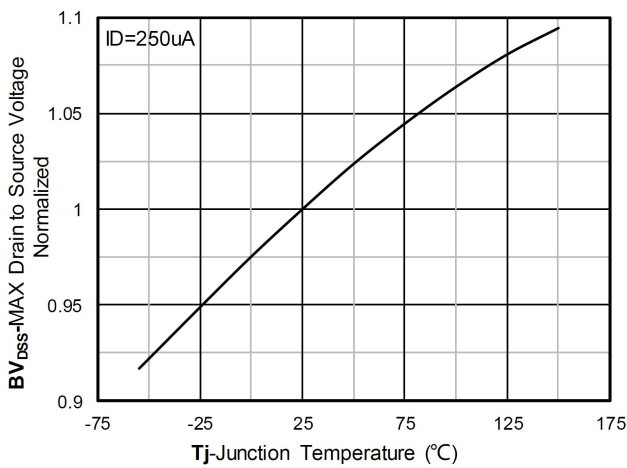
Power dissipation



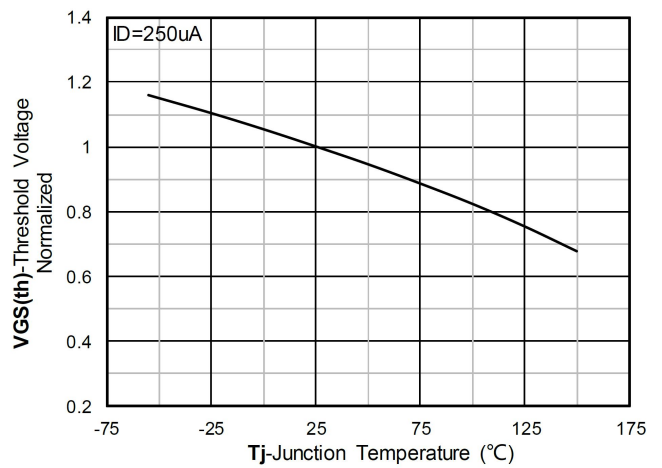
RDS(on) VS Drain Current



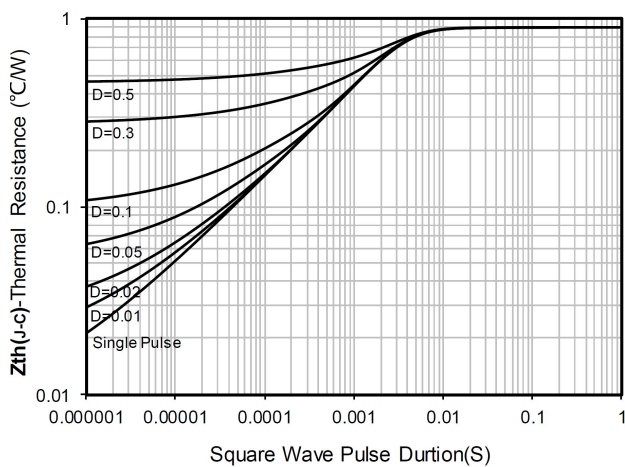
Forward characteristics of reverse diode



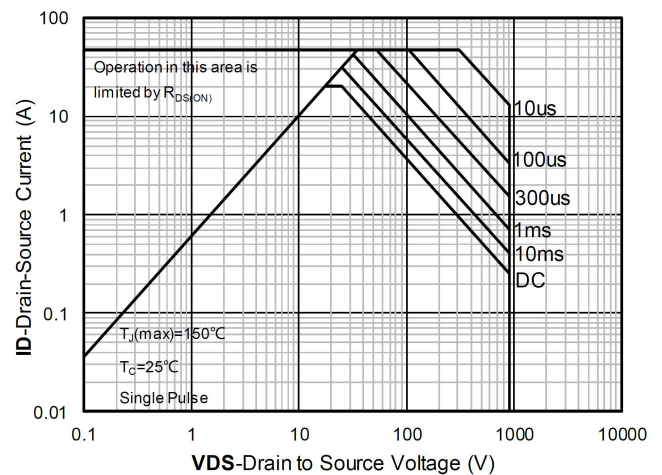
Normalized breakdown voltage



Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

