

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
700V	1290mΩ@10V	7A



**合肥矽普半导体**

*Siliup Semiconductor Technology Co., Ltd*

技术 品质 服务

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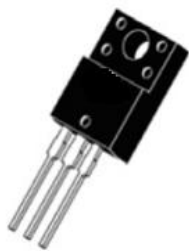
## Feature

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

## Applications

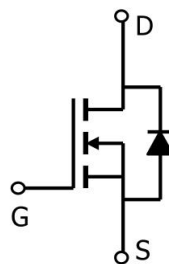
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

## Package

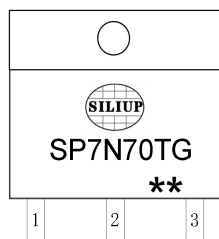


TO-220F(1:G 2:D 3:S)

## Circuit diagram



## Marking



**SP7N70TG** :Product code  
**\*\*** :Week code

## Order Information

Device	Package	Unit/Tube
SP7N70TG	TO-220F	50

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	700	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current (Tc=25°C)	$I_D$	7	A
Continuous Drain Current (Tc=100°C)	$I_D$	4.7	A
Pulsed Drain Current	$I_{DM}$	28	A
Single Pulse Avalanche Energy <sup>1</sup>	EAS	412	mJ
Power Dissipation (Tc=25°C)	$P_D$	38	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	3.3	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

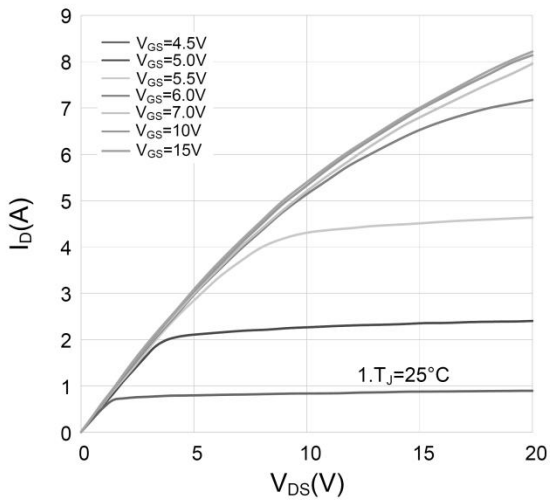
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	ID = 250μA, VGS = 0V	700	-	-	V
Drain Cut-Off Current	IDSS	VDS = 560V, VGS = 0V	-	-	1	μA
Gate Leakage Current	IGSS	VGS = ±30V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	2.0	3.0	4.0	V
Drain-Source ON Resistance	RDS(ON)	VGS = 10V, ID = 10A	-	1290	1620	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VGS=0V, VDS= 25V, F=1MHz	-	1064	-	pF
Output Capacitance	Coss		-	89	-	
Reverse Transfer Capacitance	Crss		-	5.4	-	
Total Gate Charge	Qg	VDS= 350V, ID=4A, VGS= 10V	-	21	-	nC
Gate-Source Charge	Qgs		-	5.7	-	
Gate-Drain Charge	Qgd		-	8.3	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD= 350V, ID= 4A, VGS= 10V, RG=10Ω	-	14	-	nS
Rise Time	tr		-	29	-	
Turn-Off Delay Time	td(off)		-	49	-	
Fall Time	tf		-	31	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	Is = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	7	A
Body Diode Reverse Recovery Time	Trr	Is=7A, di/dt=100A/us, TJ=25℃	-	412	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	3.1	-	uC

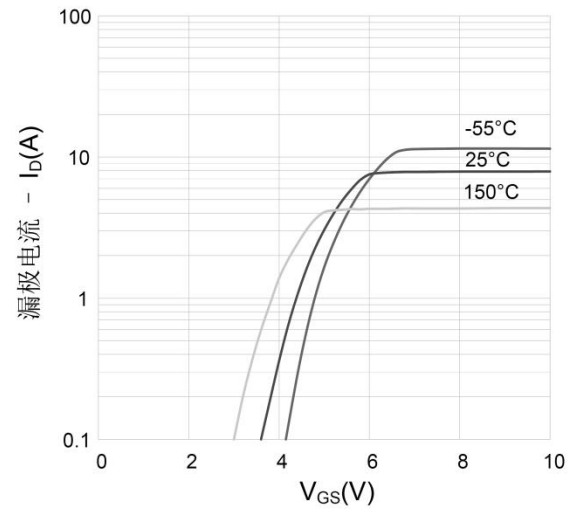
**Note :**

- The test condition is  $V_{DD}=70V, V_{GS}=10V, L=10mH, R_G=30\Omega$ ;

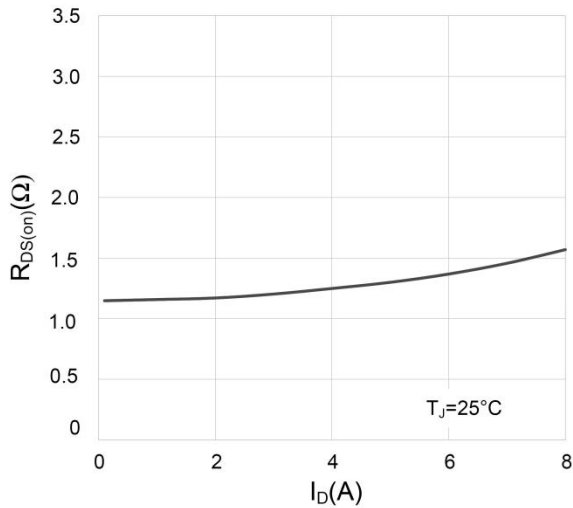
## Typical Characteristics



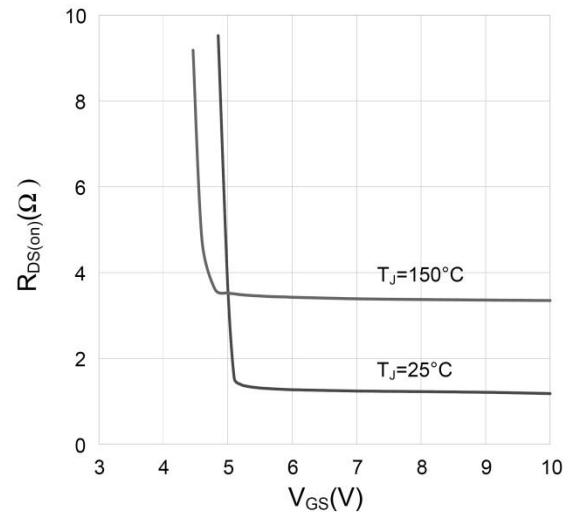
Output Characteristics



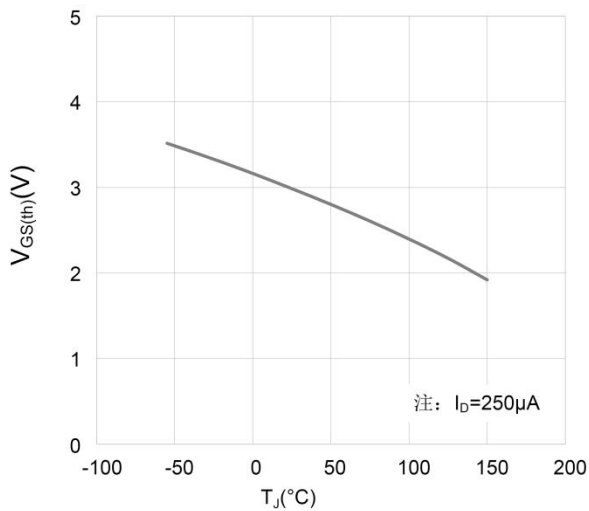
Transfer Characteristics



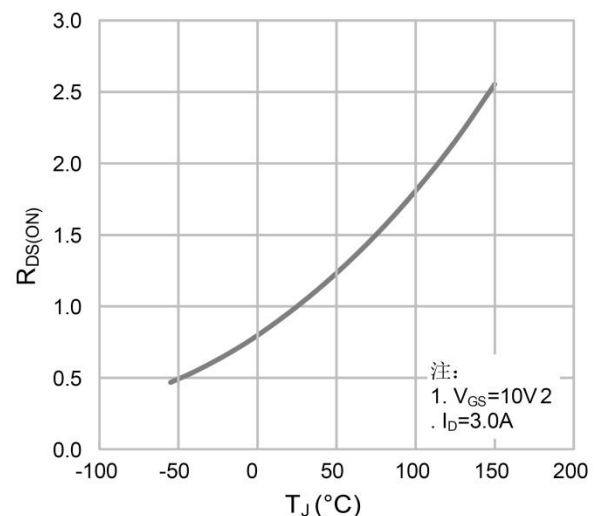
$R_{DS(on)}$  VS Drain Current



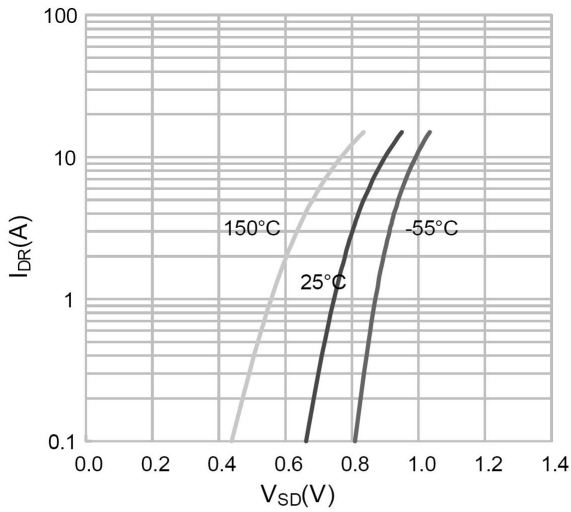
$R_{DS(on)}$  VS Drain Current



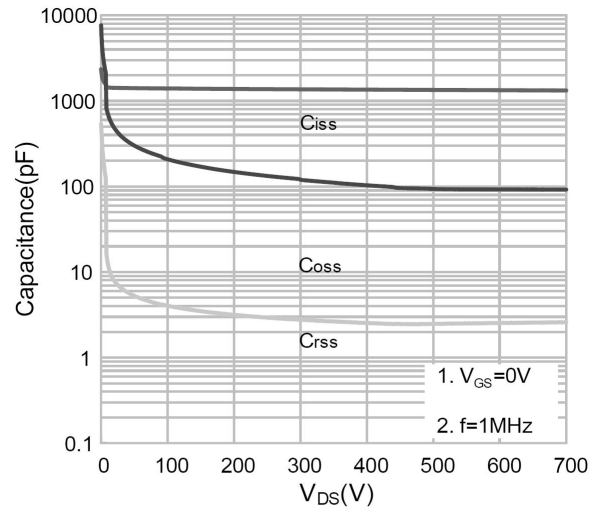
$V_{GS(th)}$  VS  $T_J$



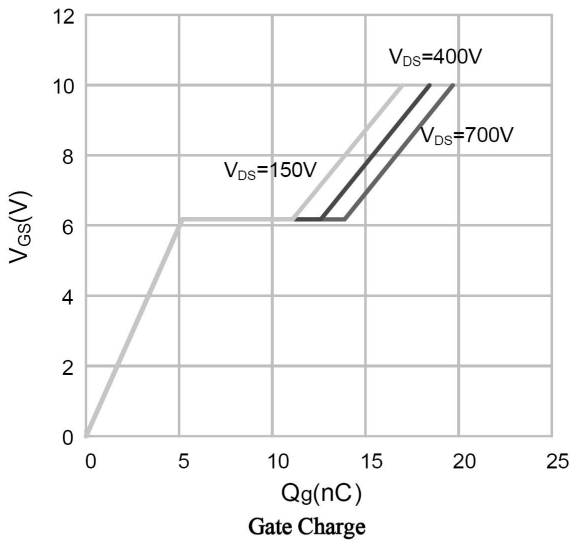
$R_{DS(on)}$  VS  $T_J$



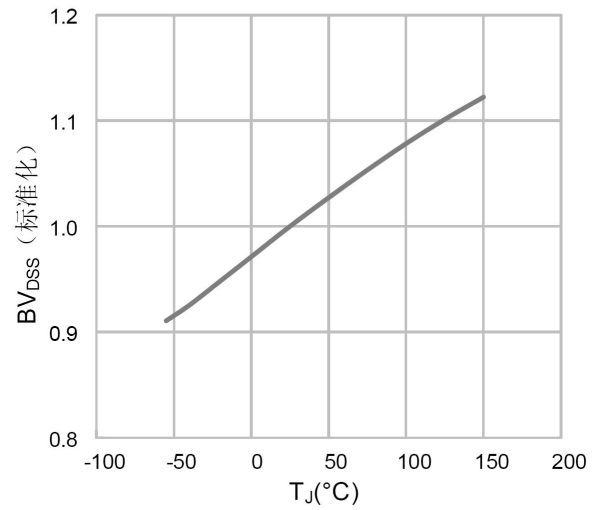
Forward characteristics of reverse diode



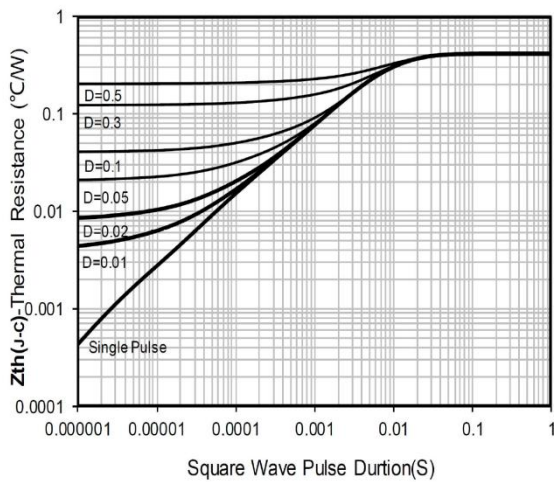
Capacitance Characteristics



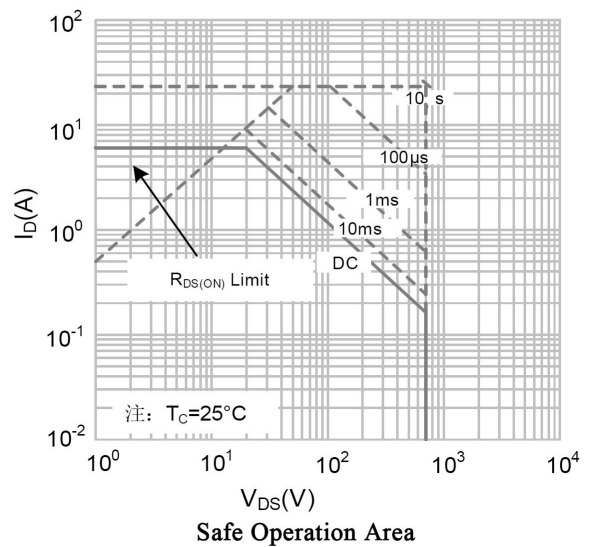
Gate Charge

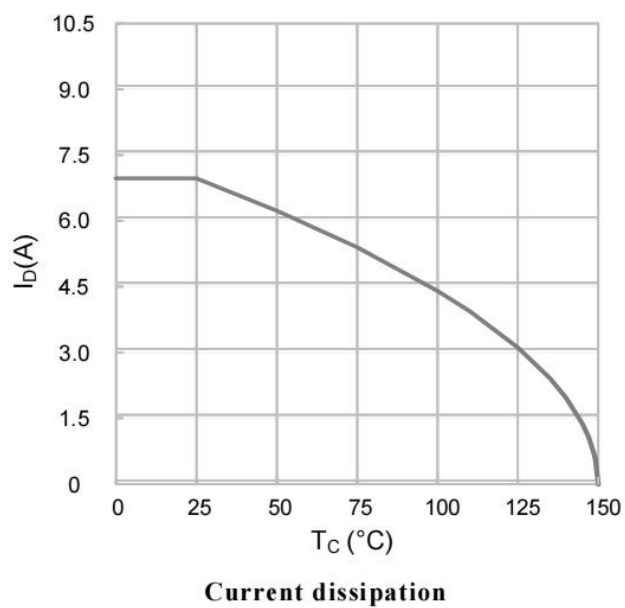
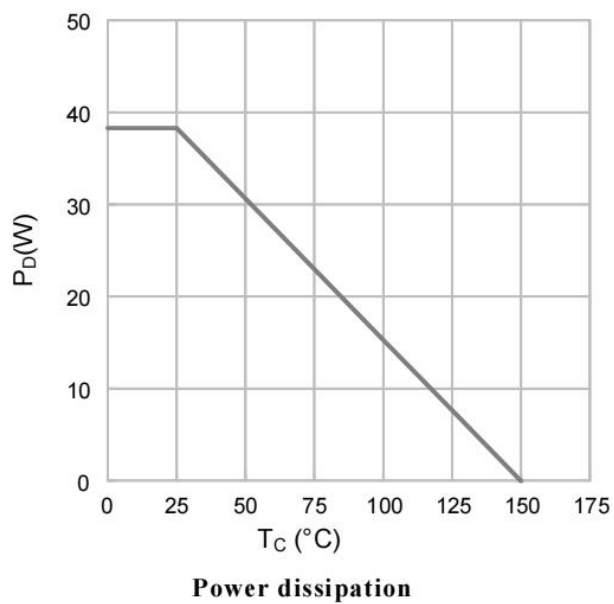


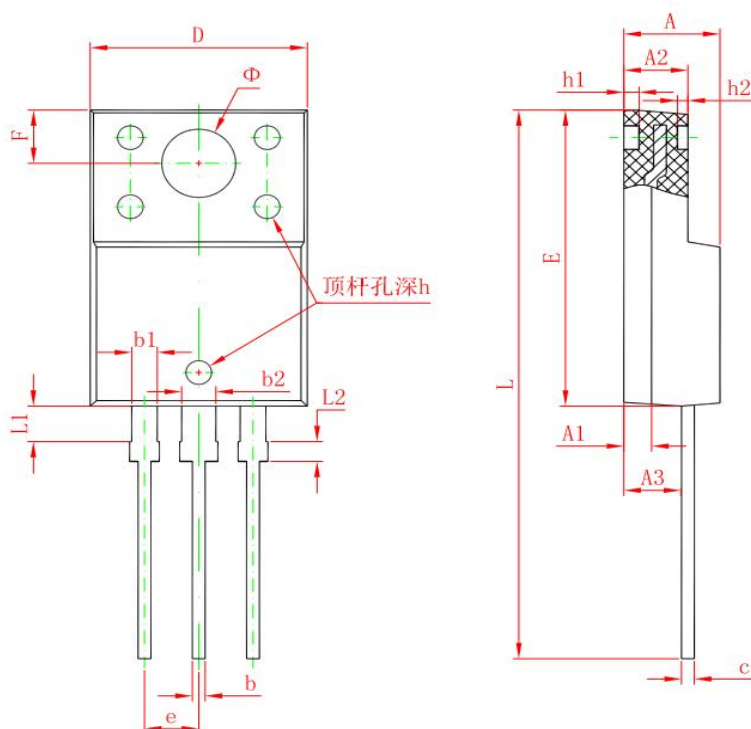
$BV_{DSS}VS T_J$



Maximum Transient Thermal Impedance





**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.	
$\Phi$	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