Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
200V	9.5mΩ@10V	110A

合肥矽普半导体
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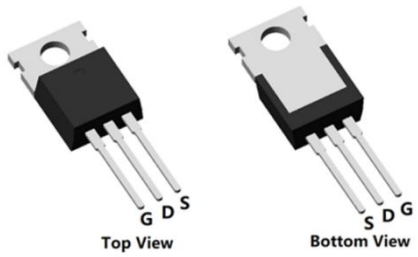
Feature

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

Applications

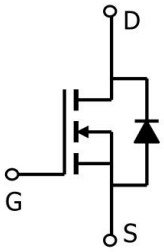
- Power switching application
- DC-DC Converter
- Power Management

Package

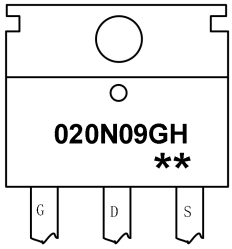


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



020N09GH : Product code
**** : Week code**

Order Information

Device	Package	Unit/Tube
SP020N09GHTQ	TO-220-3L	50

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)	I_D	110	A
Continuous Drain Current (Tc=100℃)	I_D	73	A
Pulsed Drain Current	I_{DM}	440	A
Single Pulse Avalanche Energy[1]	E_{AS}	1296	mJ
Power Dissipation (Tc=25℃)	P_D	270	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.46	℃/W
Storage Temperature Range	T_{STG}	55 to 150	℃
Operating Junction Temperature Range	T_J	55 to 150	℃

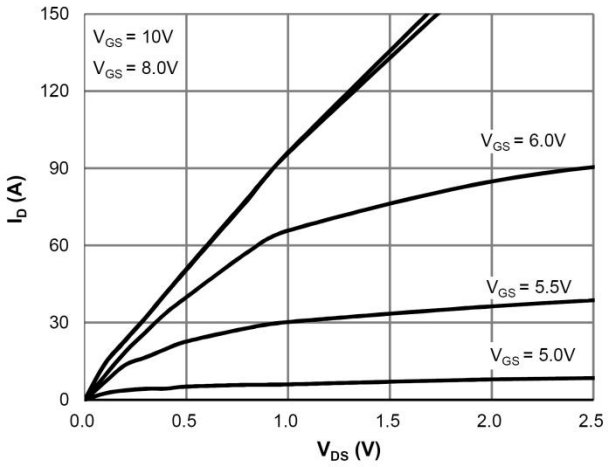
Electrical characteristics (Ta=25℃, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250μA, V_{GS} = 0V	200	-	-	V
Drain Cut-Off Current	I_{DSS}	V_{DS} = 160V, V_{GS} = 0V	-	-	1	uA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A	-	9.5	11.5	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} =100V, V_{GS} = 0V, f = 1.0MHz	-	4183	-	pF
Output Capacitance	C_{oss}		-	437	-	
Reverse Transfer Capacitance	C_{rss}		-	12	-	
Total Gate Charge	Q_g	V_{DS}=100V , VGS=10V , ID=20A	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	31	-	
Gate-Drain Charge	Q_{gd}		-	11	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = 10V, V_{DS} =100V, R_L=3.5Ω R_G = 6.0Ω	-	13	-	nS
Rise Time	t_r		-	25	-	
Turn-Off Delay Time	$t_{d(off)}$		-	31	-	
Fall Time	t_f		-	25	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	110	A
Reverse Recovery Time	Trr	I_S=140A, di/dt=100A/us, T_J=25℃	-	165	-	nS
Reverse Recovery Charge	Qrr		-	521	-	nC

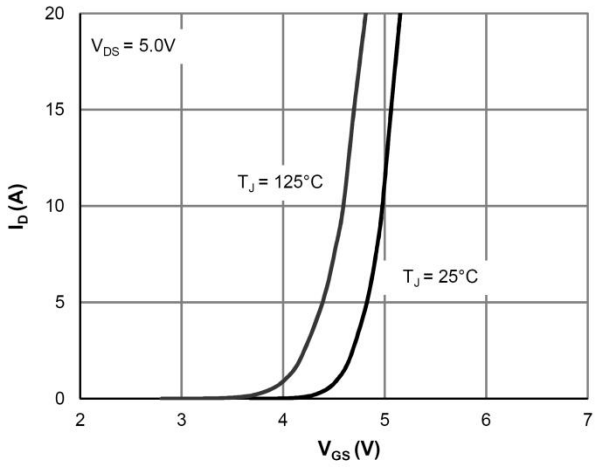
Note：

1. The EAS test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

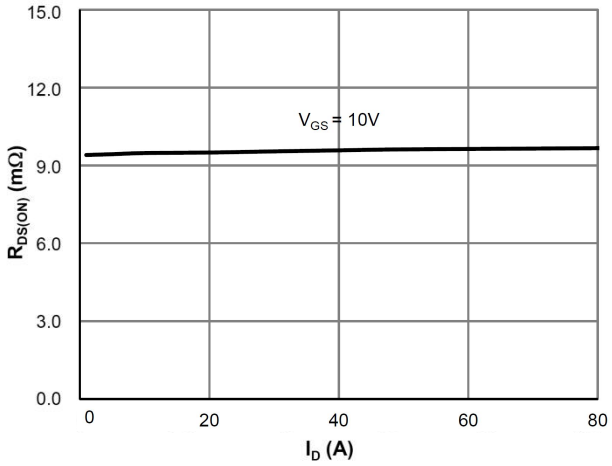
Typical Characteristics



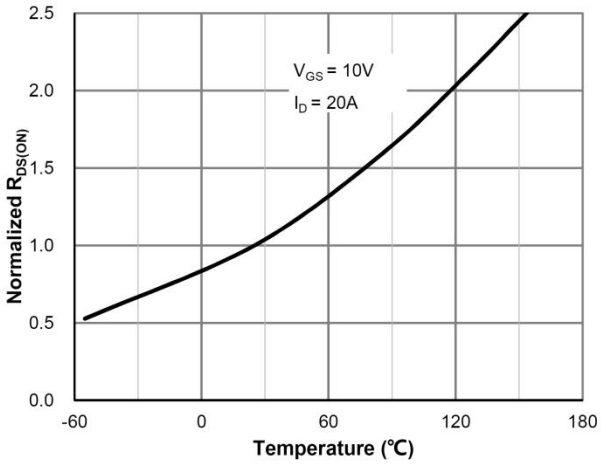
Saturation Characteristics



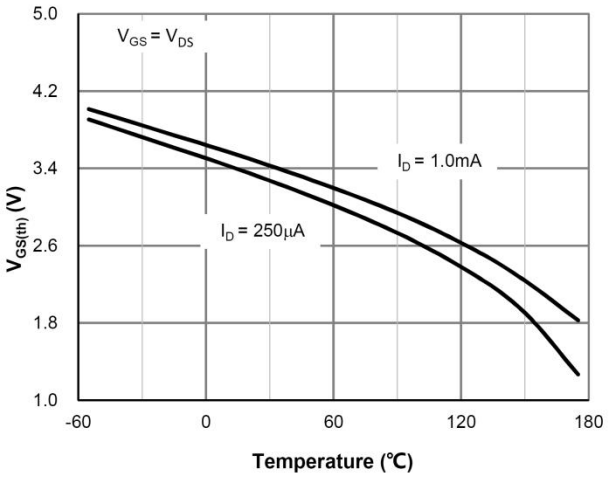
Transfer Characteristics



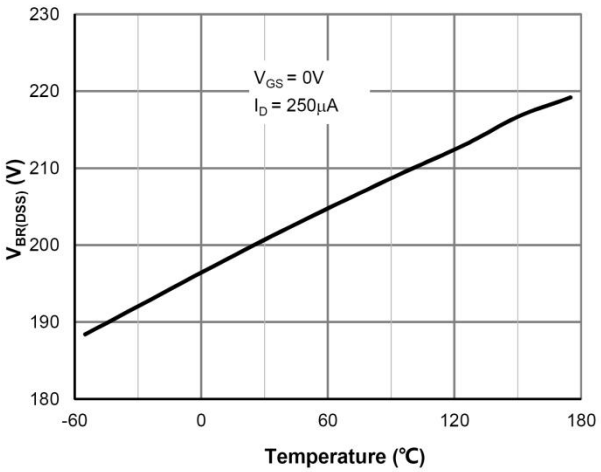
$R_{DS(ON)}$ vs. Drain Current



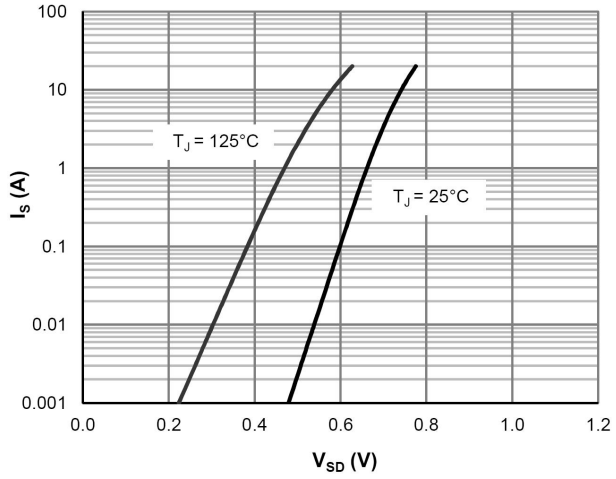
$R_{DS(ON)}$ vs. Junction Temperature



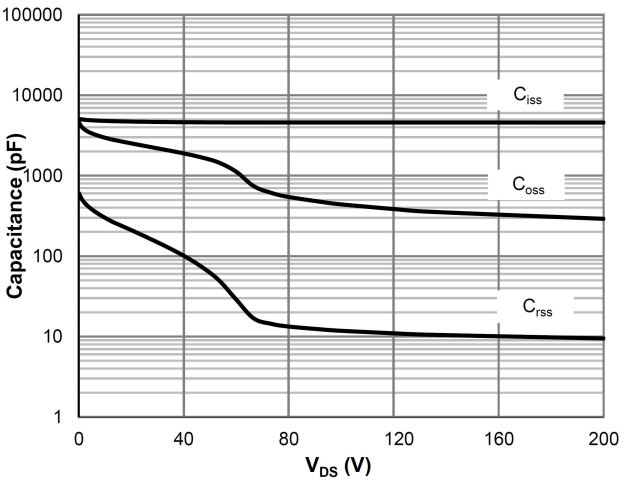
$V_{GS(th)}$ vs. Junction Temperature



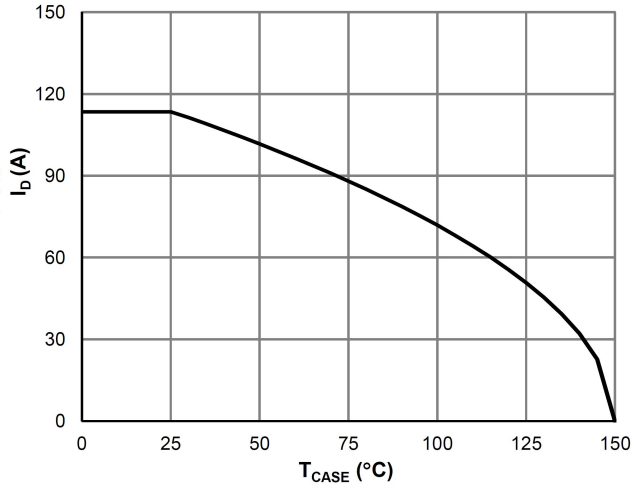
$V_{BR(DSS)}$ vs. Junction Temperature



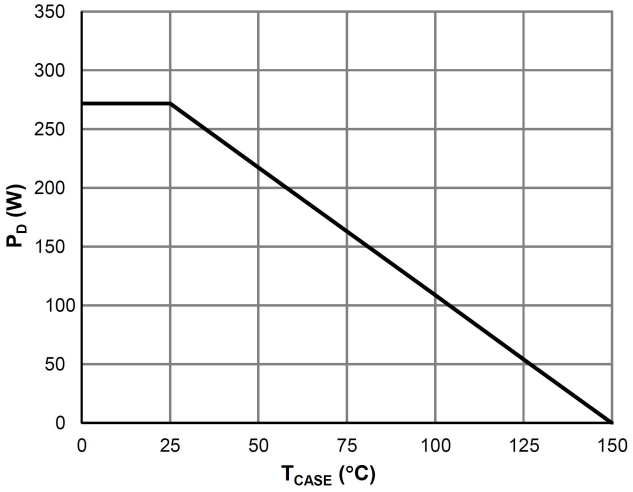
Body-Diode Characteristics



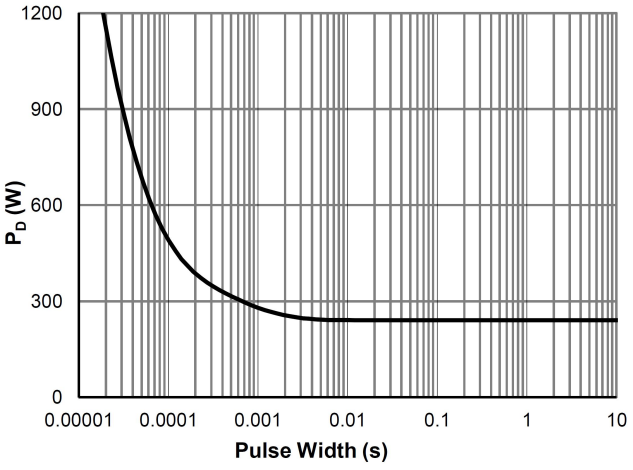
Capacitance Characteristics



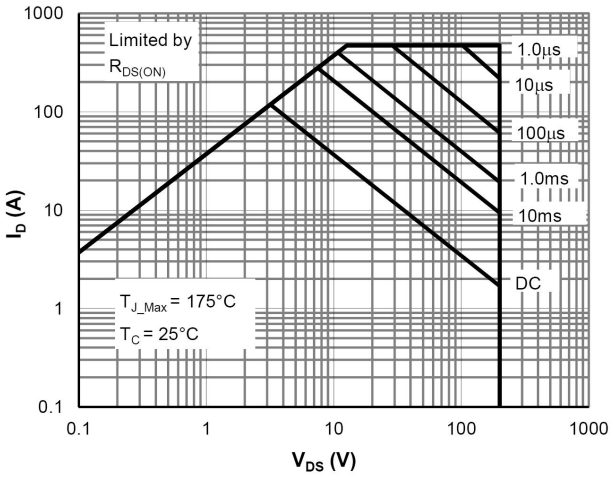
Current De-rating



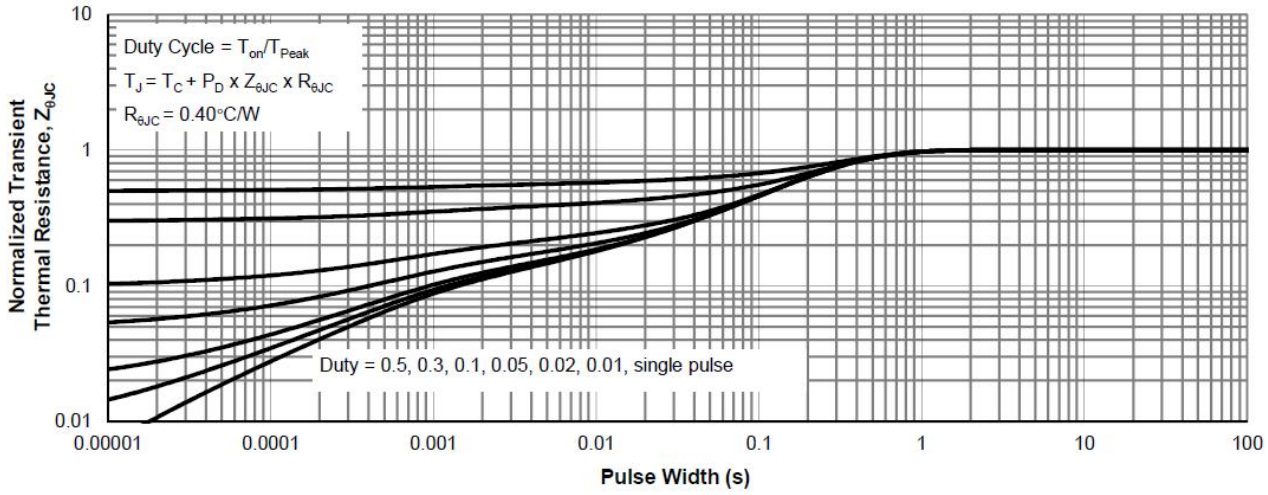
Power De-rating



Single Pulse Power Rating, Junction-to-Case

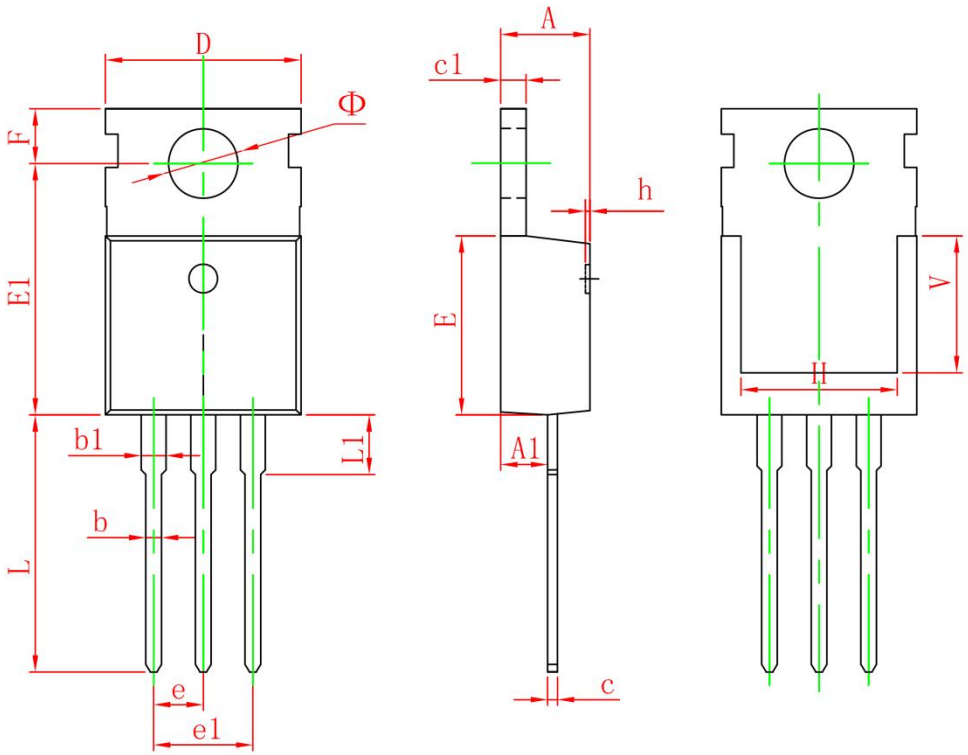


Maximum Safe Operating Area



Normalized Maximum Transient Thermal Impedance

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150