

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
200V	9.2mΩ@10V	110A



合肥矽普半导体

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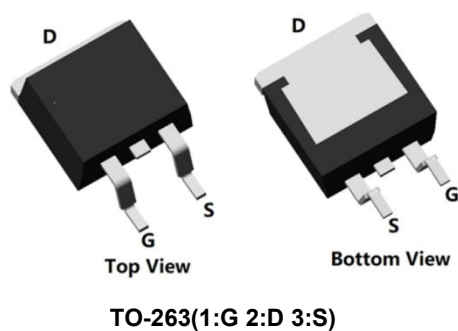
Feature

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

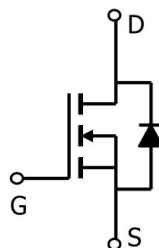
Applications

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

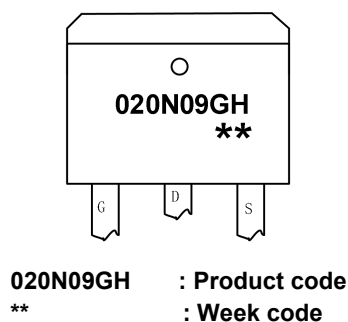
Package



Circuit diagram



Marking



Order Information

Device	Package	Unit/Tape
SP020N09GHTD	TO-263	800

Absolute maximum ratings (Ta=25°C, 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°C)	I_D	110	A
Continuous Drain Current (Tc=100°C)	I_D	73	A
Pulsed Drain Current	I_{DM}	440	A
Single Pulse Avalanche Energy ¹	E_{AS}	1296	mJ
Power Dissipation (Tc=25°C)	P_D	270	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.46	°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)

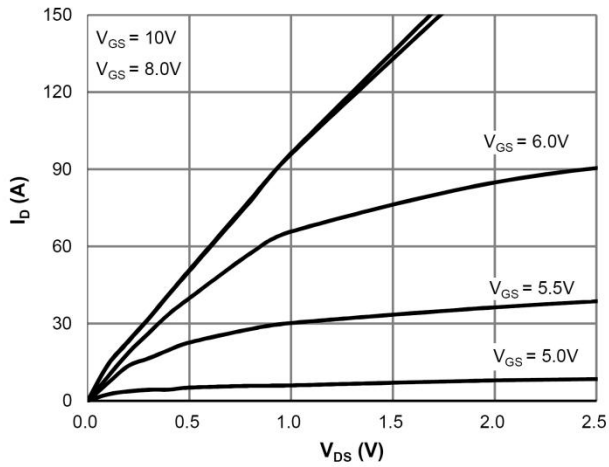
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu A, V_{GS} = 0V$	200	-	-	V
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 160V, V_{GS} = 0V$	-	-	1	uA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 0.1	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	9.2	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	$V_{DS} = 100V, V_{GS} = 10V, I_D = 20A$	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	31	-	
Gate-Drain Charge	Q_{gd}		-	11	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 100V, R_L = 3.5\Omega$ $R_G = 6.0\Omega$	-	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}	$V_{GS} = 0V, I_S = 1A, T_J = 25^\circ C$	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	110	A
Reverse Recovery Time	T_{rr}	$I_S = 140A, di/dt = 100A/us, T_J = 25^\circ C$	-	165	-	nS
Reverse Recovery Charge	Q_{rr}		-	521	-	nC

Note:

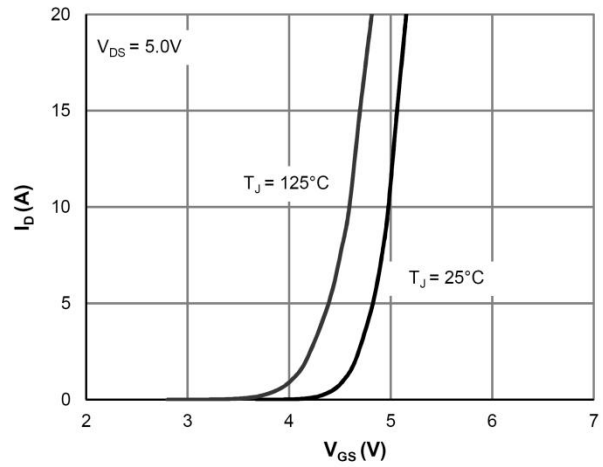
- The EAS test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$



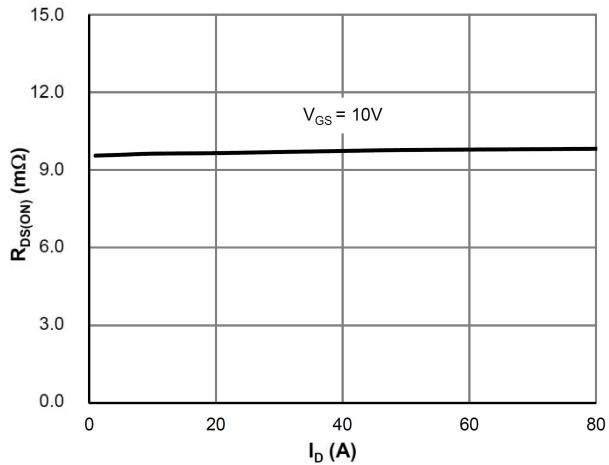
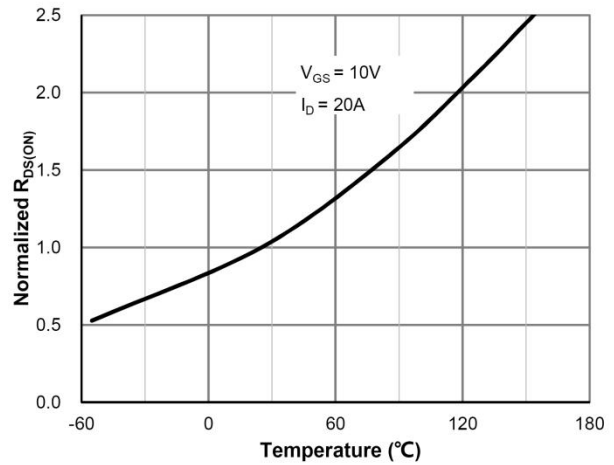
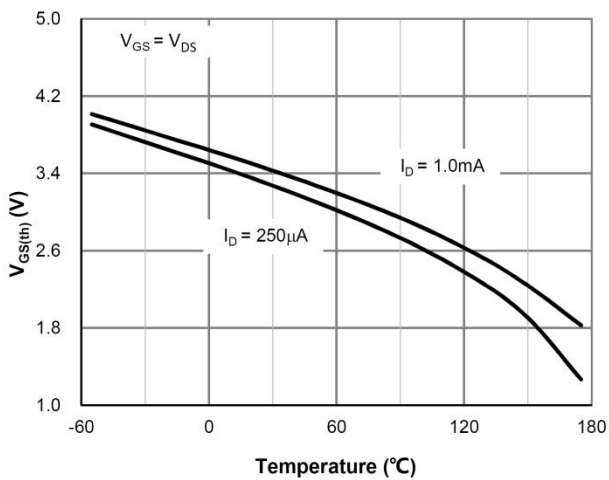
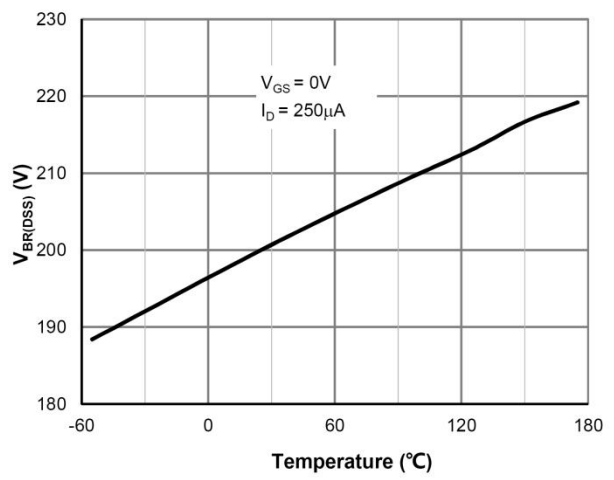
Typical Characteristics

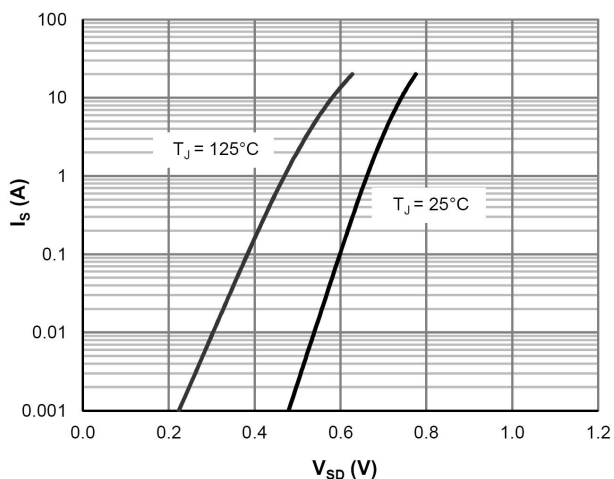


Saturation Characteristics

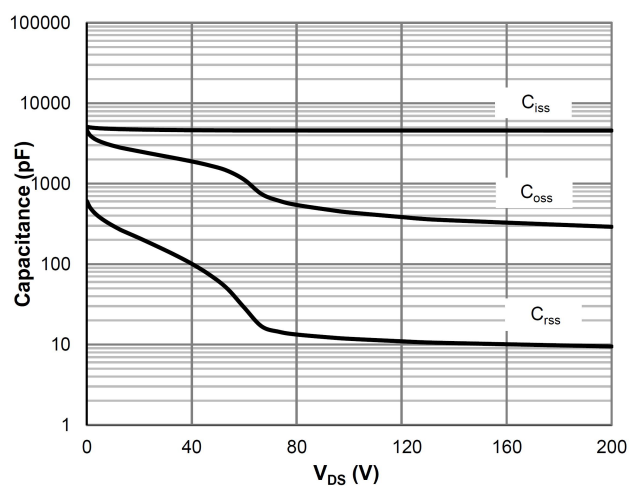


Transfer Characteristics

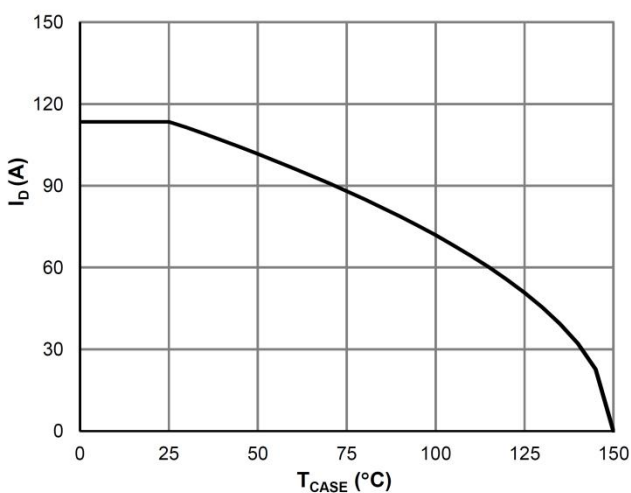
 $R_{DS(on)}$ vs. Drain Current $R_{DS(on)}$ vs. Junction Temperature $V_{GS(th)}$ vs. Junction Temperature $V_{BR(DSS)}$ vs. Junction Temperature



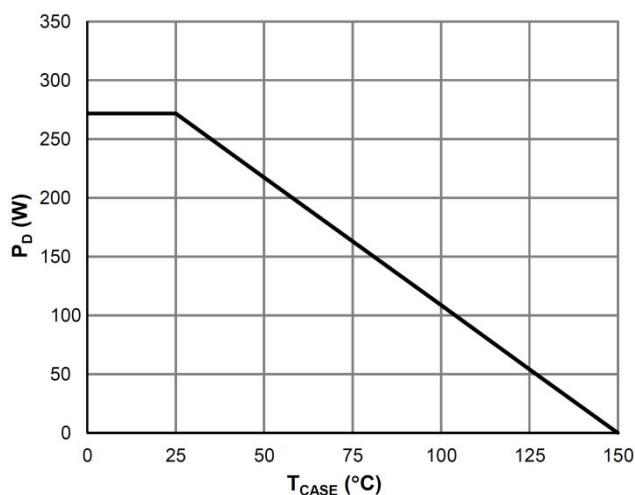
Body-Diode Characteristics



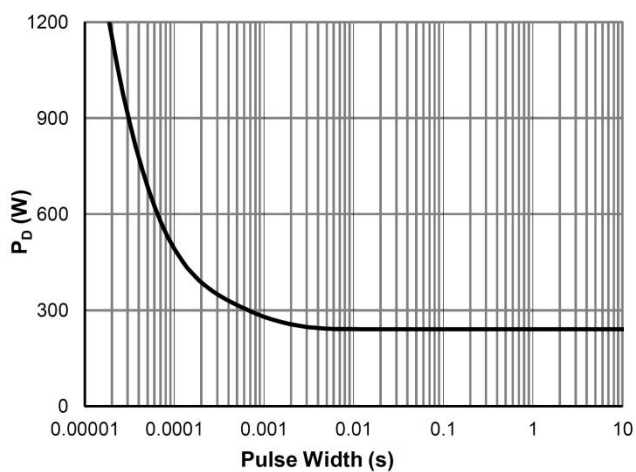
Capacitance Characteristics



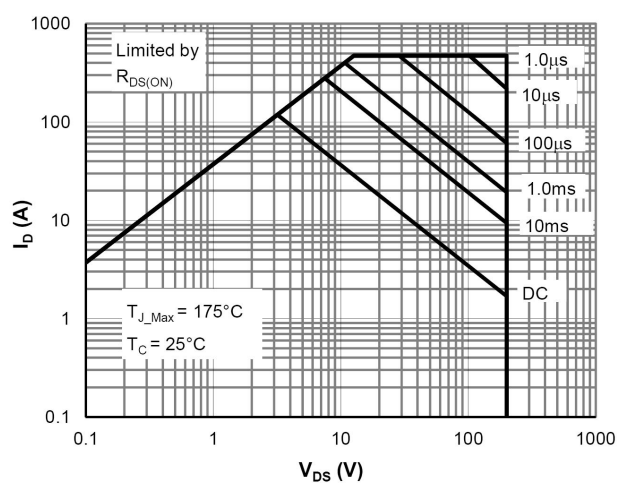
Current De-rating



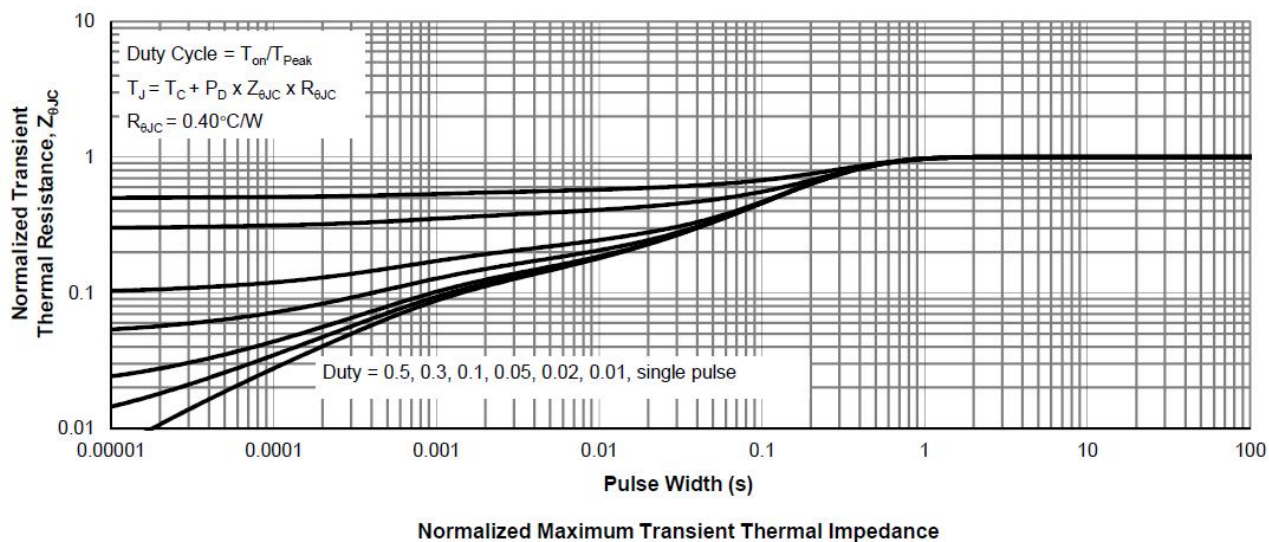
Power De-rating



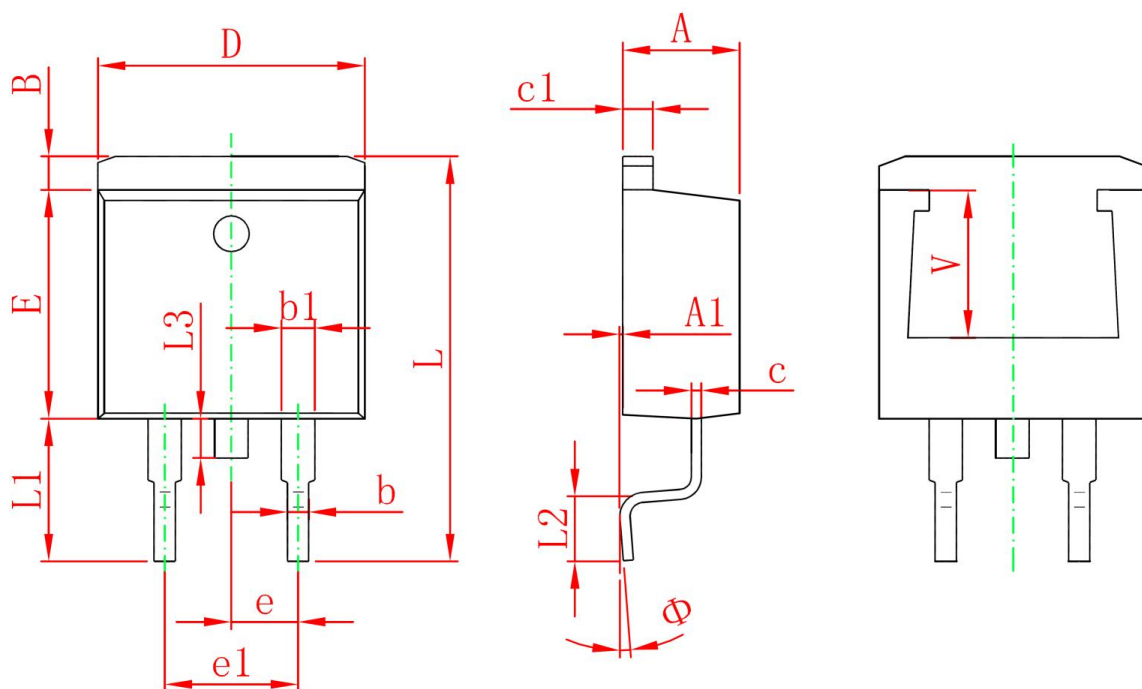
Single Pulse Power Rating, Junction-to-Case



Maximum Safe Operating Area



TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	