

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
150V	13mΩ@10V	60A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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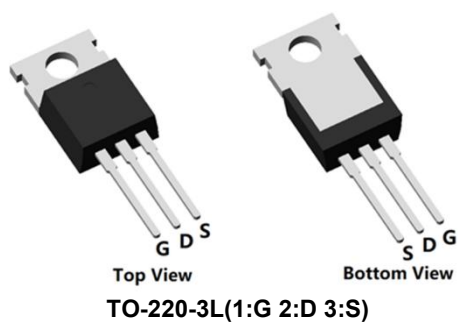
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

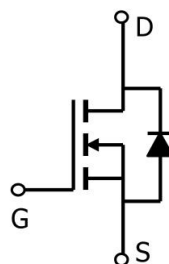
Applications

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

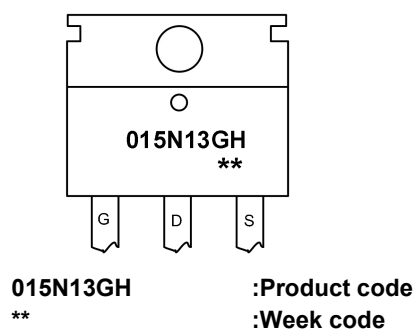
Package



Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP015N13GHTQ	TO-220-3L	50

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	60	A
Continuous Drain Current (Tc=100°C)	I_D	40	A
Pulsed Drain Current	I_{DM}	240	A
Single Pulse Avalanche Energy ¹	E_{AS}	306	mJ
Power Dissipation (Tc=25°C)	P_D	160	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.78	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

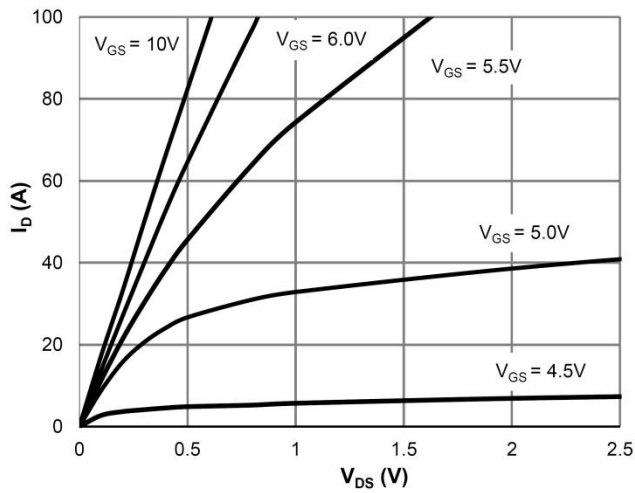
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID = 250μA, VGS = 0V	150	-	-	V
Drain Cut-Off Current	IDSS	VDS = 120V, VGS = 0V	-	-	1	μA
Gate Leakage Current	IGSS	VGS = ±20V, VDS = 0V	-	-	±0.1	
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 = 20A	-	13	16	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VDS = 75V, VGS = 0V, f = 1.0MHz	-	2230	-	pF
Output Capacitance	Coss		-	293	-	
Reverse Transfer Capacitance	Crss		-	22	-	
Total Gate Charge	Qg	VDS=75V , VGS=10V , ID=20A	-	30	-	nC
Gate-Source Charge	Qgs		-	5.8	-	
Gate-Drain Charge	Qgd		-	7	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VGS = 10V, VDS = 50V, ID = 20A RG = 6Ω	-	13	-	nS
Rise Time	tr		-	25	-	
Turn-Off Delay Time	td(off)		-	31	-	
Fall Time	tf		-	25	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	Is = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	60	A
Body Diode Reverse Recovery Time	Trr	Is=20A, di/dt=100A/us, TJ=25℃	-	65	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	180	-	nC

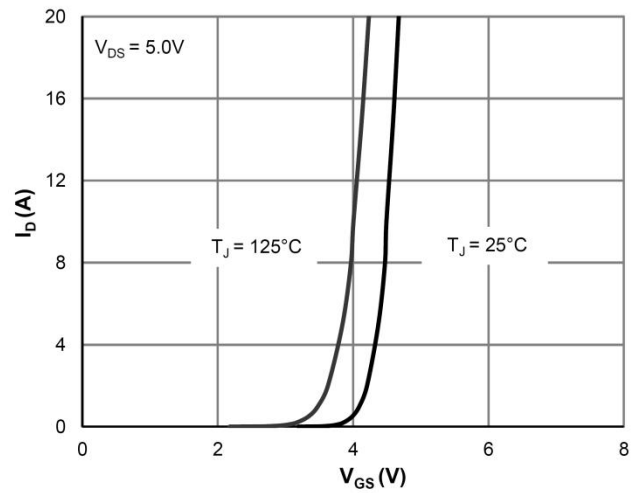
Note :

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

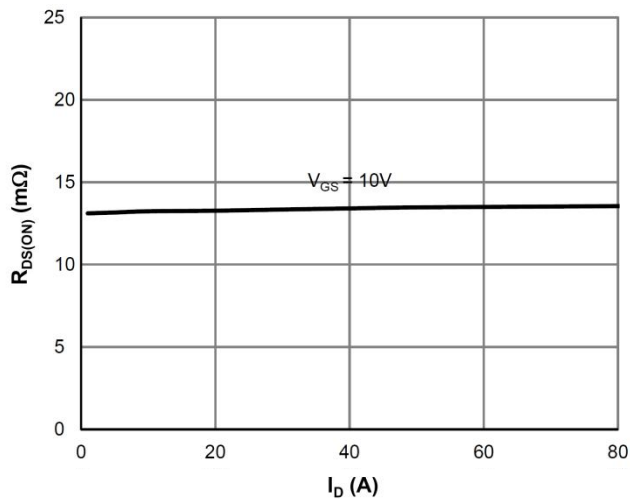
Typical Characteristic



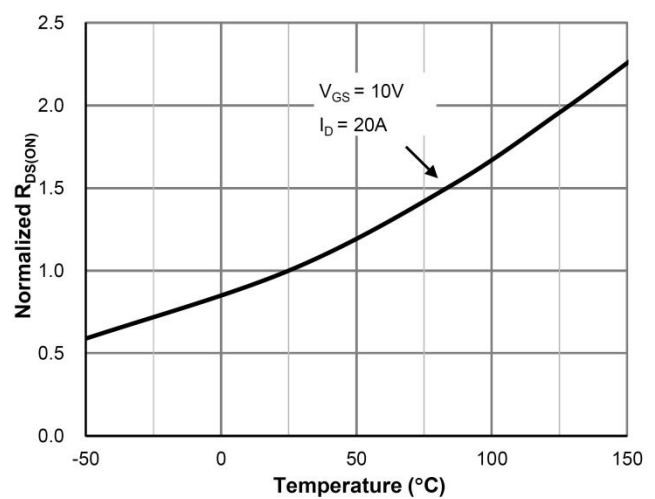
Saturation Characteristics



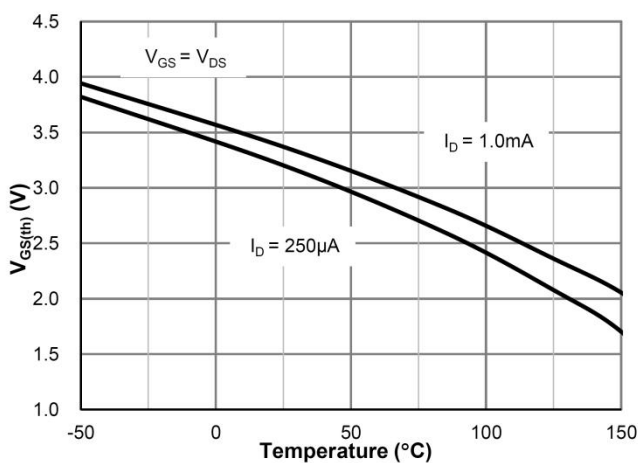
Transfer Characteristics



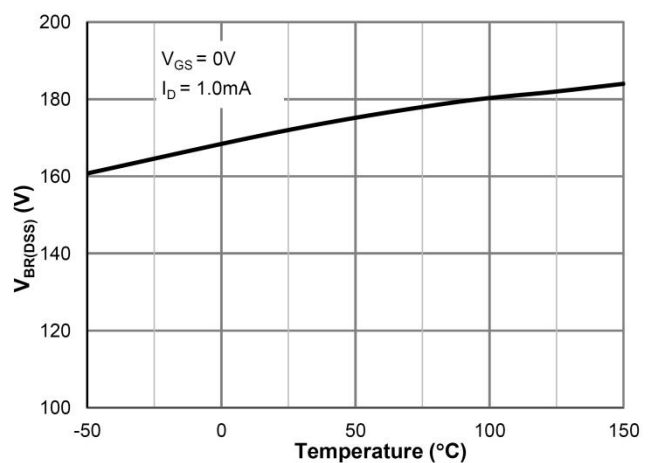
$R_{DS(ON)}$ vs. Drain Current



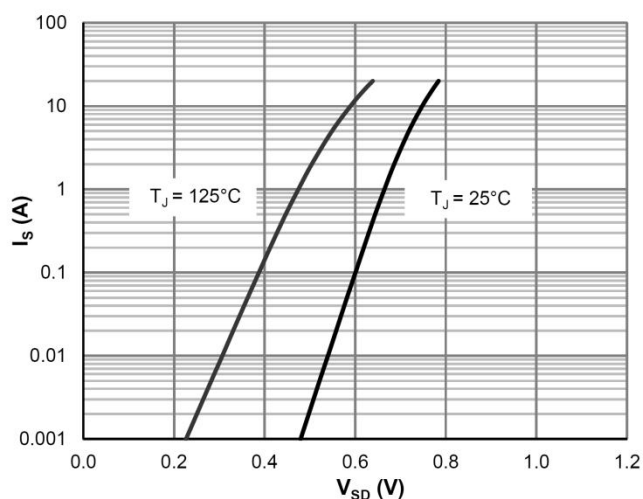
$R_{DS(ON)}$ vs. Junction Temperature



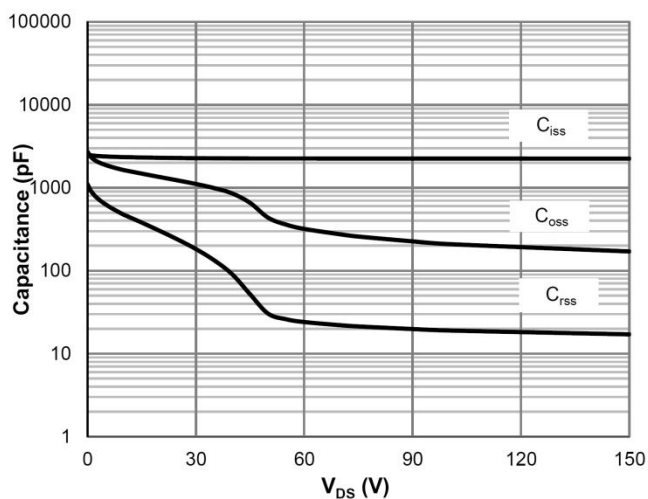
$V_{GS(th)}$ vs. Junction Temperature



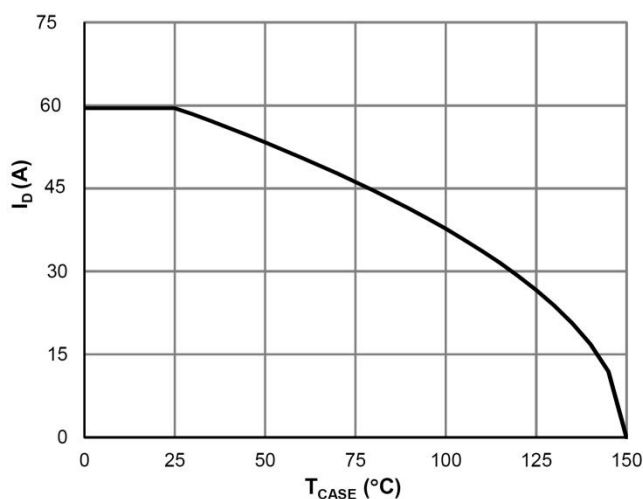
$V_{BR(DSS)}$ vs. Junction Temperature



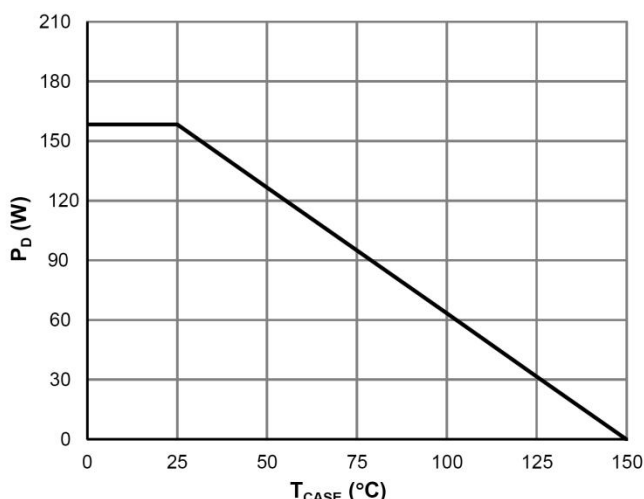
Body-Diode Characteristics



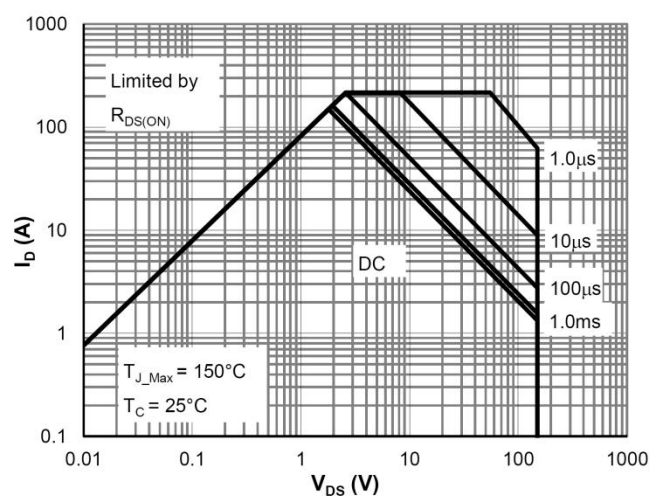
Capacitance Characteristics



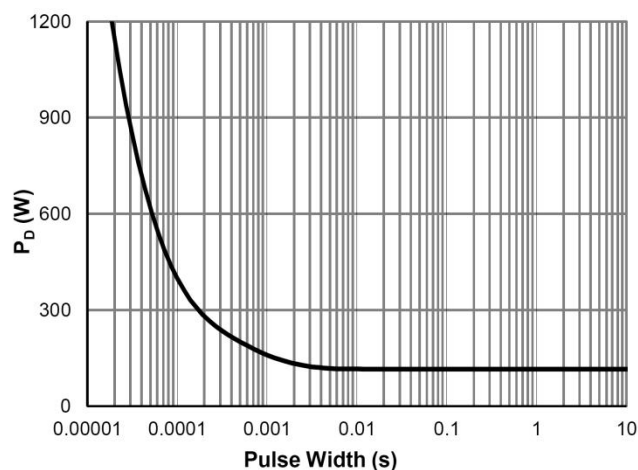
Current De-rating



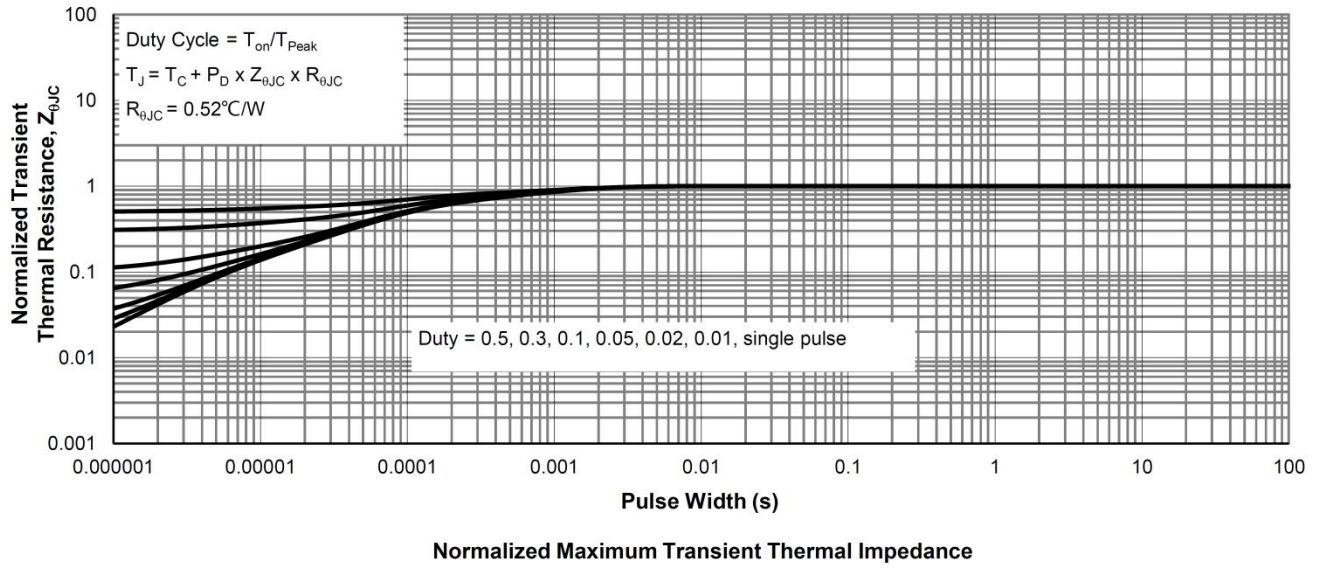
Power De-rating

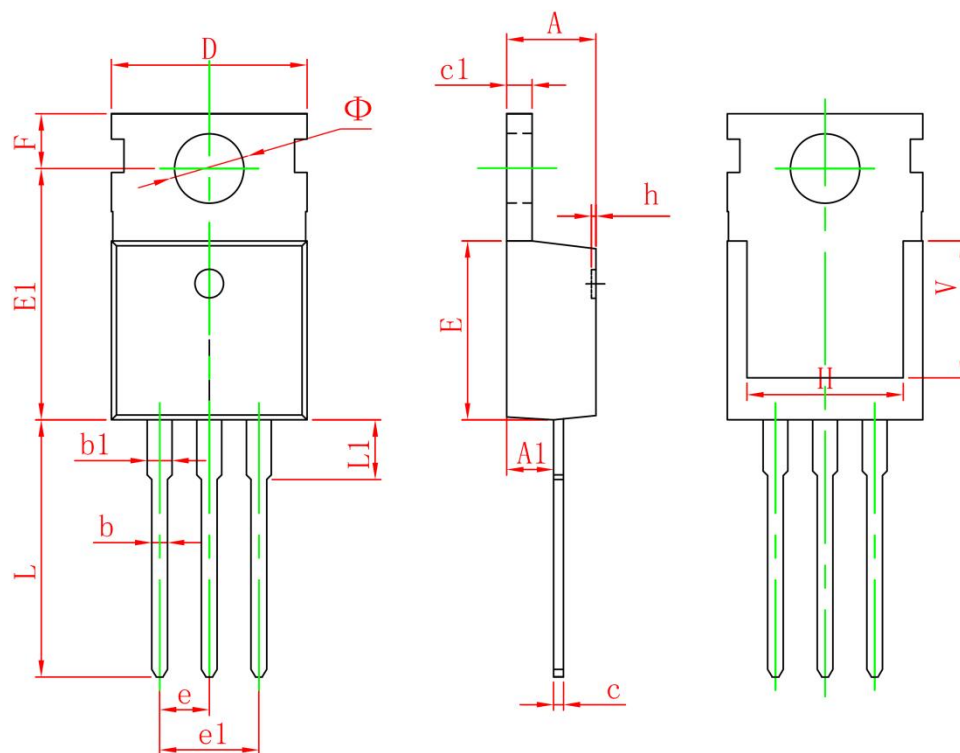


Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case



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