

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
150V	13mΩ@10V	55A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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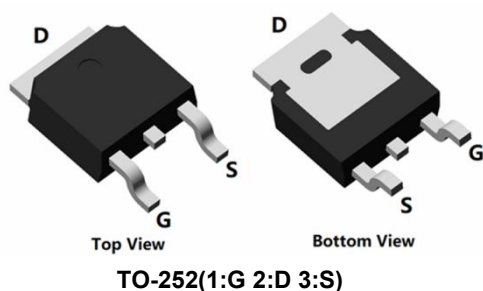
Feature

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

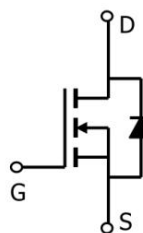
Applications

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

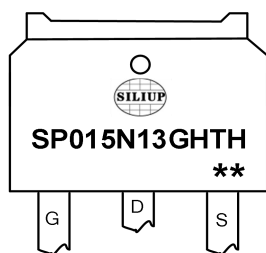
Package



Circuit diagram



Marking



SP015N13GHTH : Product code
** : Week code

Order Information

Device	Package	Unit/Tube
SP015N13GHTH	TO-252	2500

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	55	A
Continuous Drain Current (Tc=100°C)	I_D	38	A
Pulsed Drain Current	I_{DM}	220	A
Single Pulse Avalanche Energy ¹	E_{AS}	272	mJ
Power Dissipation (Tc=25°C)	P_D	135	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.93	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

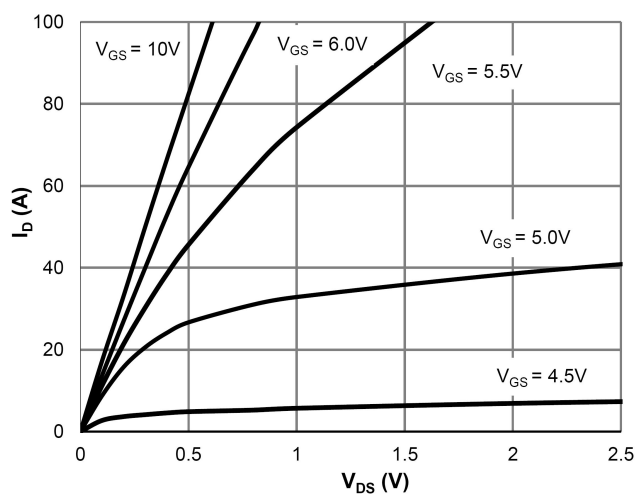
Electrical characteristics (Ta=25°C, unless otherwise noted)

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	I _{DSS}	VDS = 120V, VGS = 0V	-	-	1	μA
Gate Leakage Current	I _{GSS}	VGS = ±20V, VDS = 0V	-	-	±0.1	
Gate Threshold Voltage	V _{GS(th)}	VDS = VGS, ID = 250μA	2.0	3.0	4.0	V
Drain-Source ON Resistance	R _{DS(ON)}	VGS = 10V, ID = 20A	-	13	16	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	VDS = 75V, VGS = 0V, f = 1.0MHz	-	2230	-	pF
Output Capacitance	C _{oss}		-	293	-	
Reverse Transfer Capacitance	C _{rss}		-	22	-	
Total Gate Charge	Q _g	VDS=75V , VGS=10V , ID=20A	-	30	-	nC
Gate-Source Charge	Q _{gs}		-	5.8	-	
Gate-Drain Charge	Q _{gd}		-	7	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	VGS = 10V, VDS = 50V, ID =20A RG = 6Ω	-	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}	I _S = 1A, VGS = 0V, TJ=25°C	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	55	A
Body Diode Reverse Recovery Time	T _{rr}	I _S =20A, di/dt=100A/us, TJ=25°C	-	65	-	nS
Body Diode Reverse Recovery Charge	Q _{rr}		-	180	-	nC

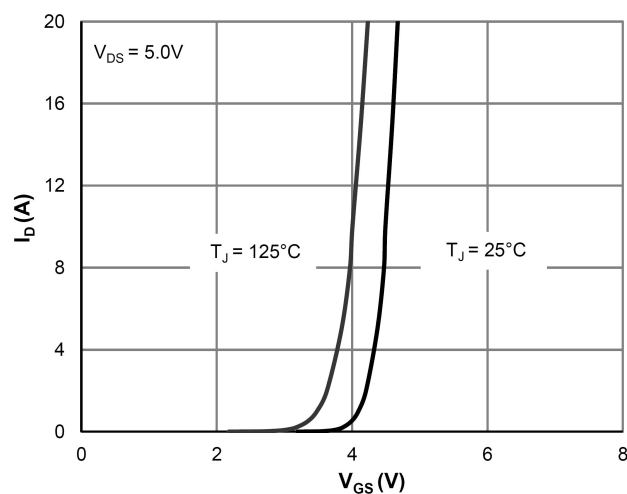
Note :

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

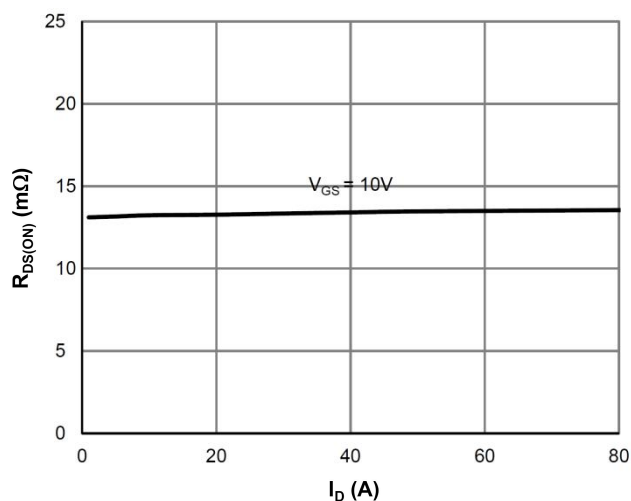
Typical Characteristic



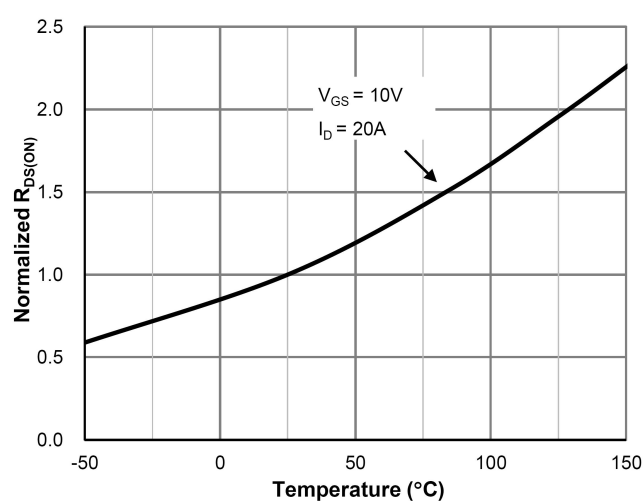
Saturation Characteristics



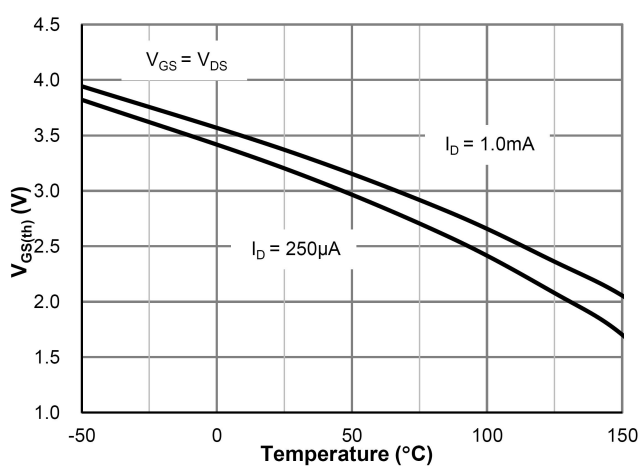
Transfer Characteristics



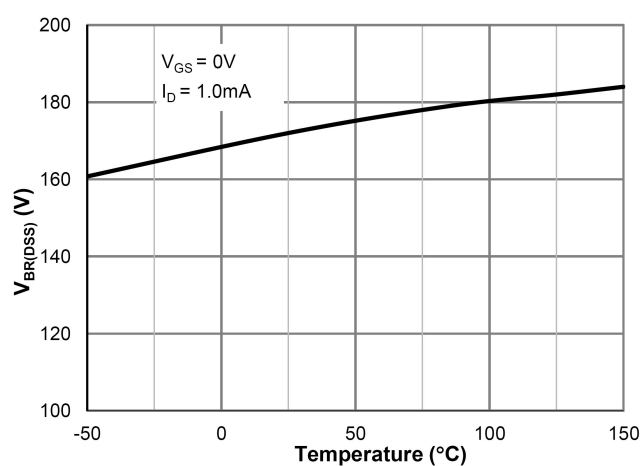
$R_{DS(ON)}$ vs. Drain Current



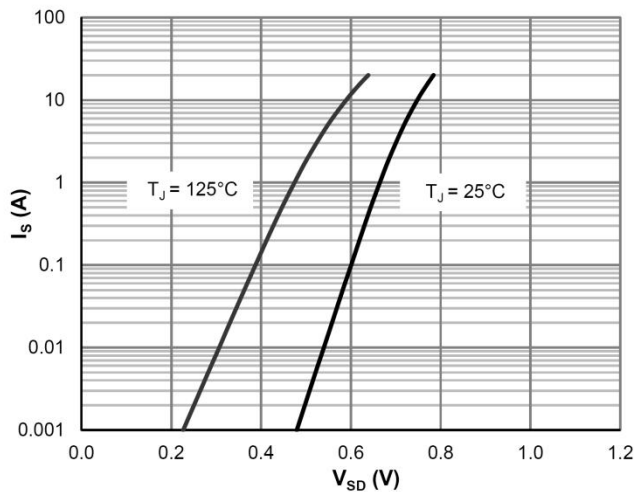
$R_{DS(ON)}$ vs. Junction Temperature



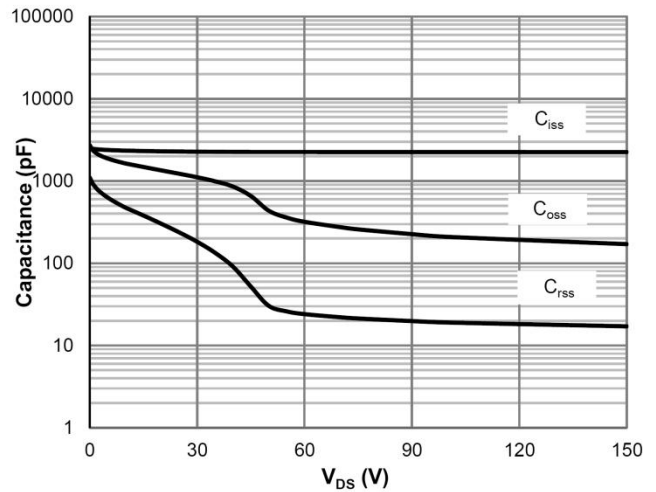
$V_{GS(th)}$ vs. Junction Temperature



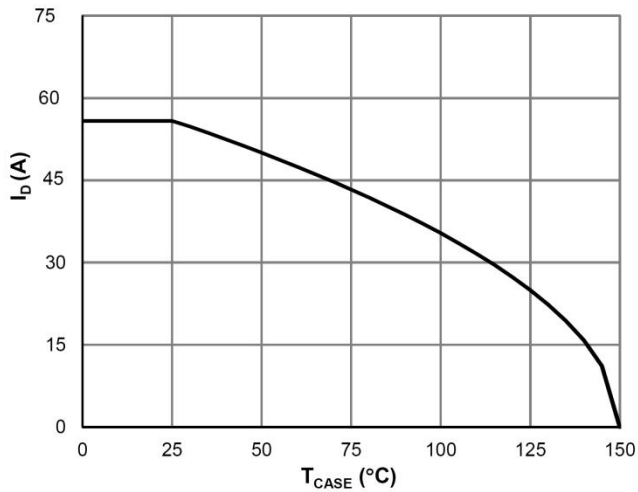
$V_{BR(DSS)}$ vs. Junction Temperature



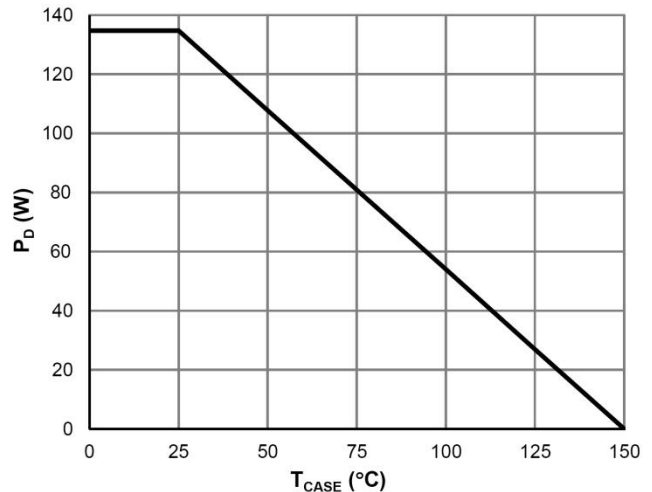
Body-Diode Characteristics



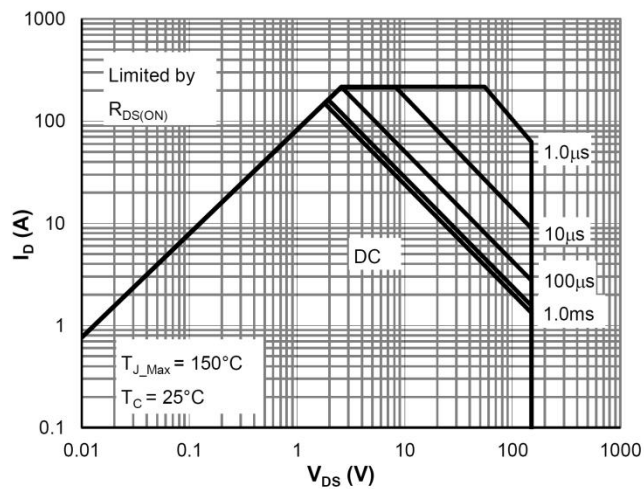
Capacitance Characteristics



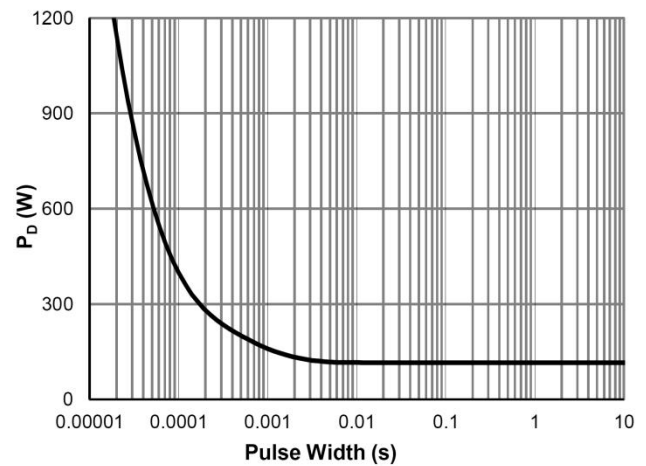
Current De-rating



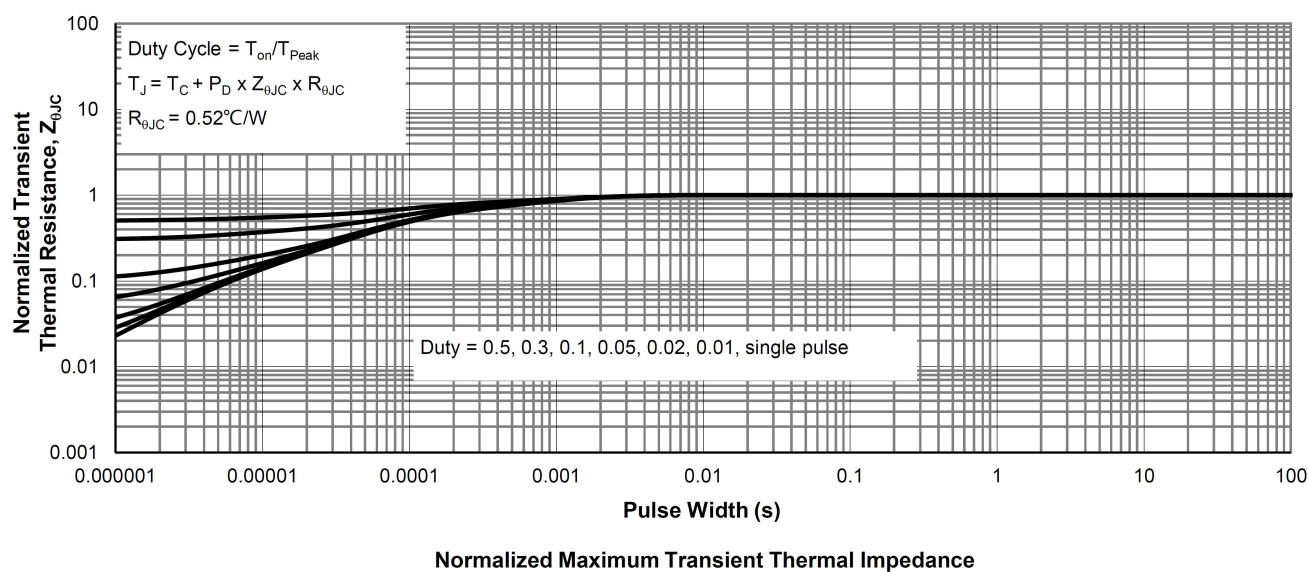
Power De-rating

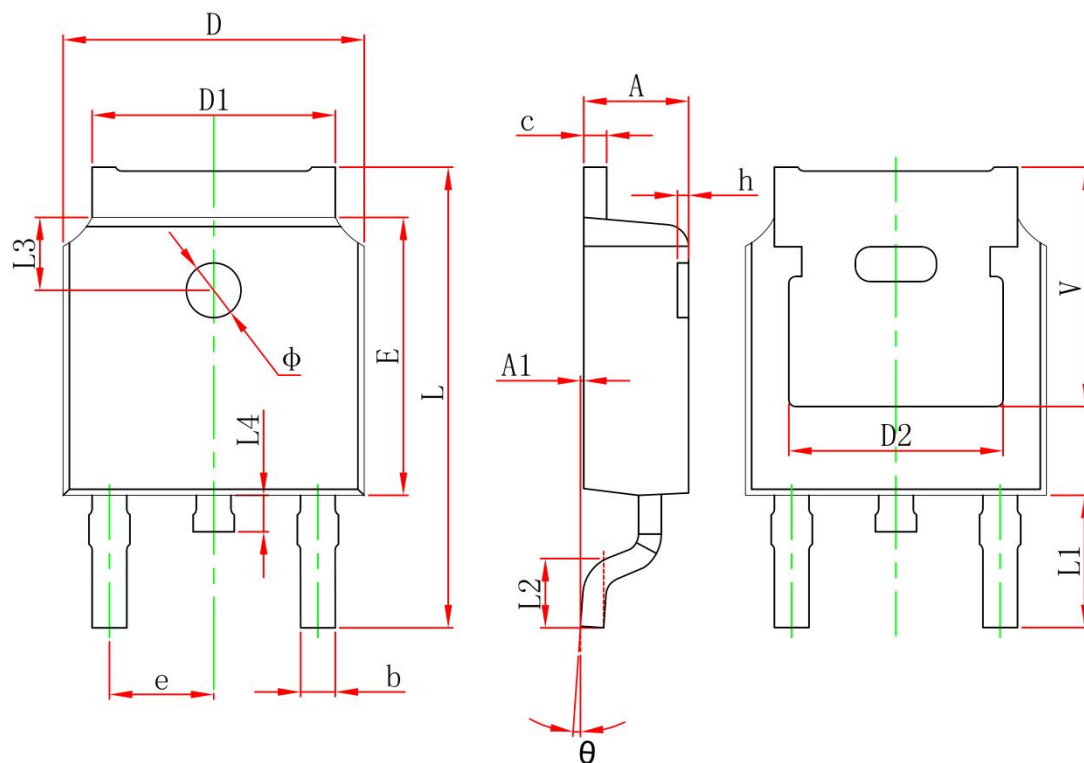


Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case



TO-252 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	