

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
100V	13m $\Omega$ @10V	45A
	16m $\Omega$ @4.5V	



**合肥矽普半导体**

Siliup Semiconductor Technology Co., Ltd

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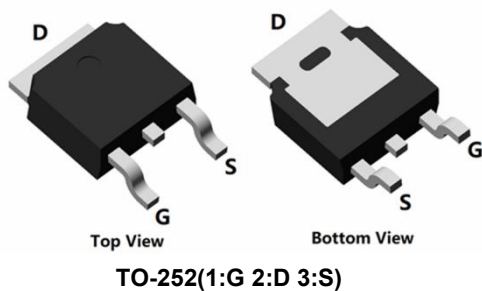
## Feature

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

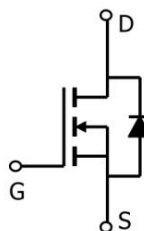
## Applications

- Power switching application
- Battery management
- Uninterruptible power supply

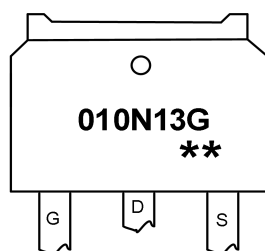
## Package



## Circuit diagram



## Marking



**010N13G** : Product code  
**\*\*** : Week code

## Order Information

Device	Package	Unit/Tube
SP010N13GTH	TO-252	2500

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tc=25°C)	$I_D$	45	A
Continuous Drain Current (Tc=100°C)	$I_D$	30	A
Pulsed Drain Current	$I_{DM}$	180	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	144	mJ
Power Dissipation (Tc=25°C)	$P_D$	75	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.67	°C/W
Storage Temperature Range	$T_{STG}$	55 to 150	°C
Operating Junction Temperature Range	$T_J$	55 to 150	°C

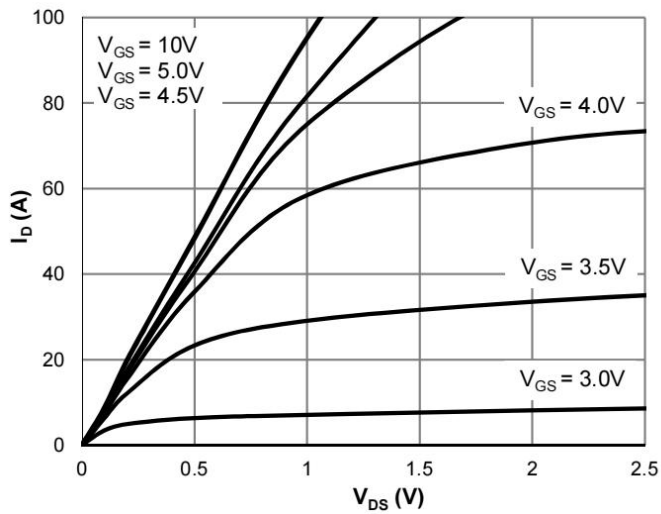
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	100	-	-	V
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±0.1	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.8	2.5	V
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	13	17	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A	-	16	21	
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	1225	-	pF
Output Capacitance	C <sub>oss</sub>		-	379	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	17	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V , V <sub>GS</sub> =10V , I <sub>D</sub> =20A	-	14	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	5	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.7	-	
Switching Characteristics						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> =50V, I <sub>D</sub> =20A R <sub>G</sub> = 2.2Ω	-	38	-	nS
Rise Time	t <sub>r</sub>		-	12	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	51	-	
Fall Time	t <sub>f</sub>		-	17	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	45	A
Reverse Recovery Time	T <sub>rr</sub>	I <sub>S</sub> =20A, di/dt=100A/us, T <sub>J</sub> =25℃	-	40	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	42	-	nC

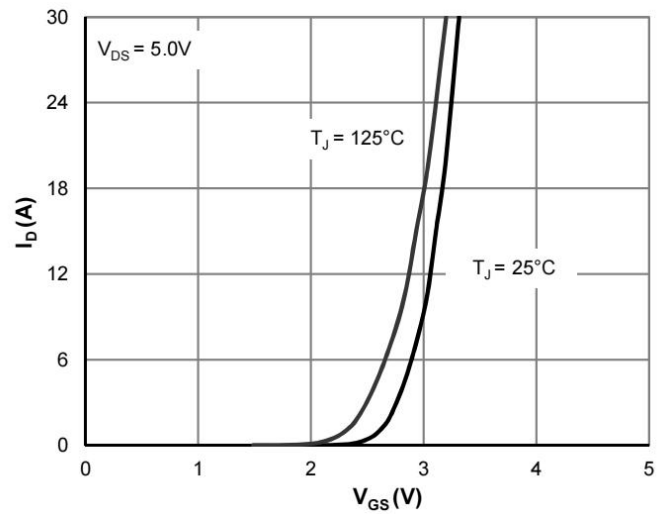
**Note:**

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

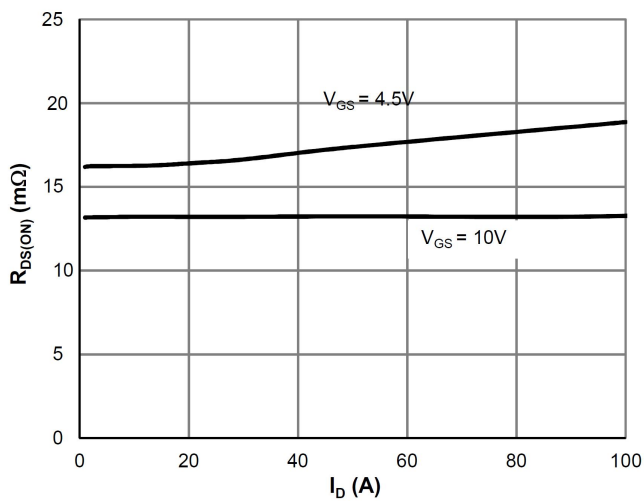
## Typical Characteristics



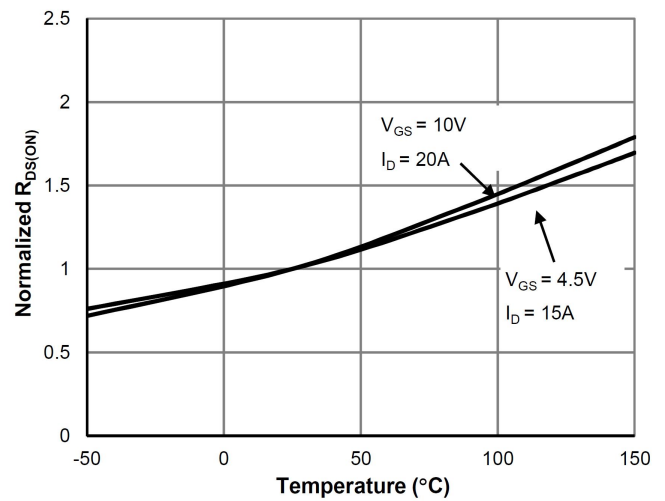
Typical Output Characteristics



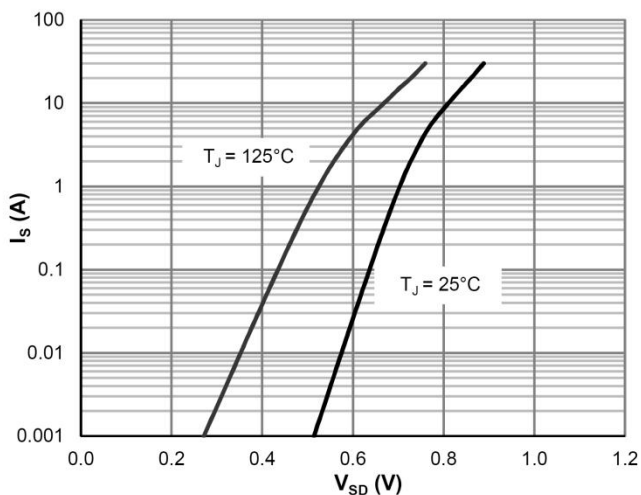
Transfer Characteristics



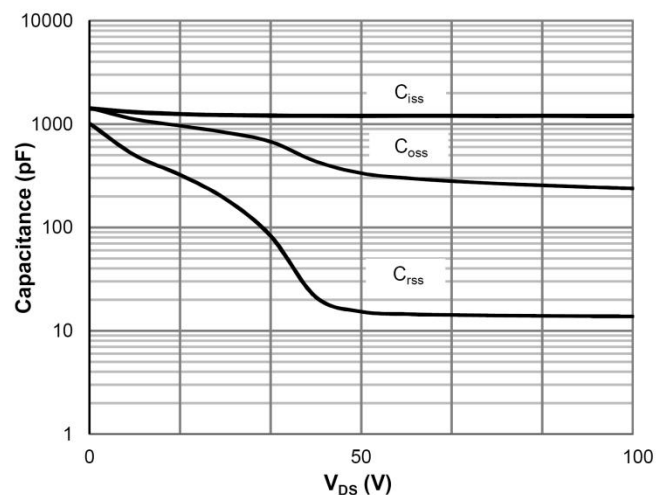
On-Resistance vs. Drain Current



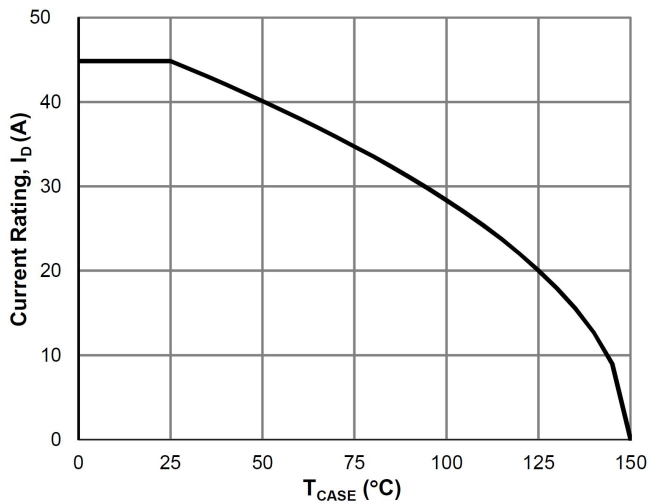
On-Resistance vs. Junction Temperature



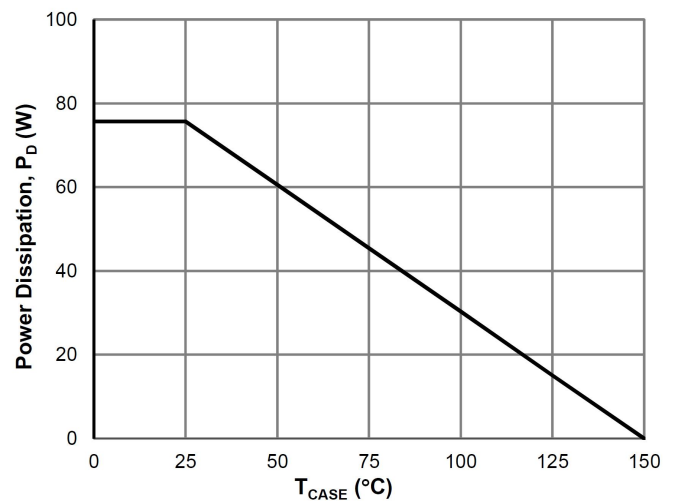
Body-Diode Characteristics



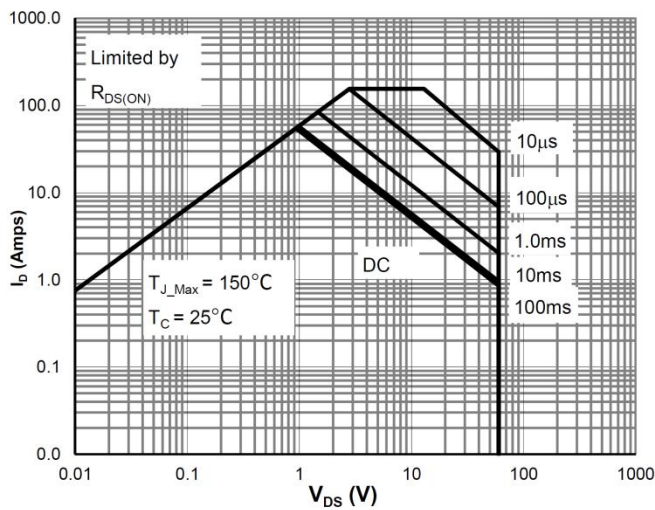
Capacitance Characteristics



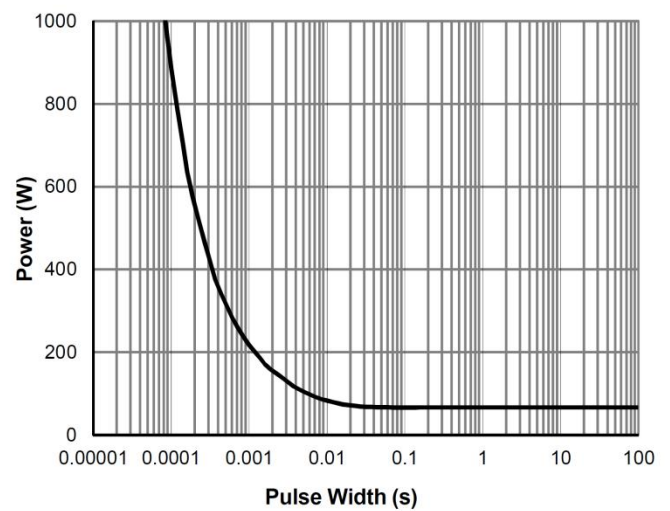
Current De-rating



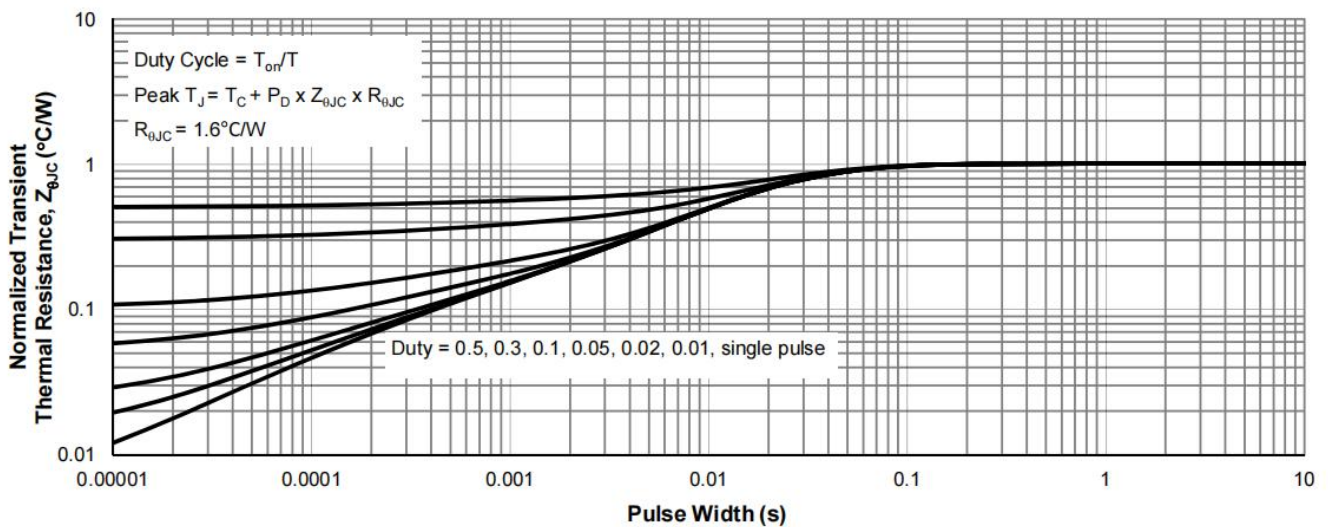
Power De-rating



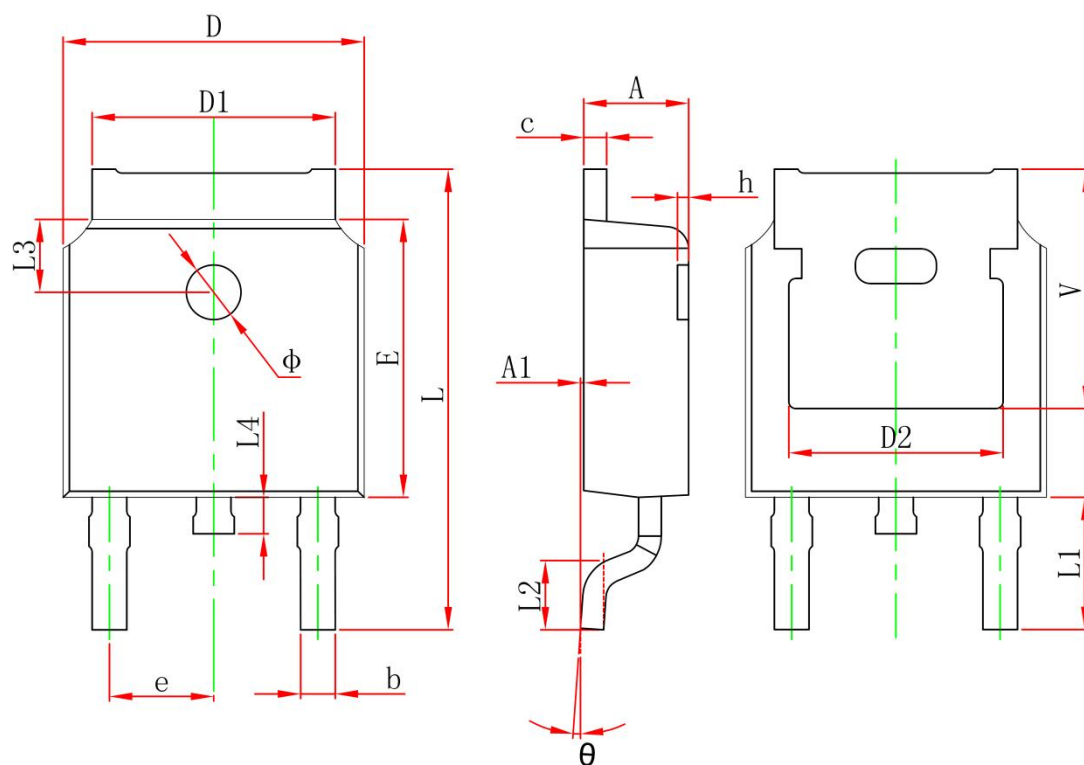
Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case



Normalized Maximum Transient Thermal Impedance

**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
$\phi$	1.100	1.300	0.043	0.051
$\theta$	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	