Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	1.9mΩ@10V	200A

合肥矽普半导体
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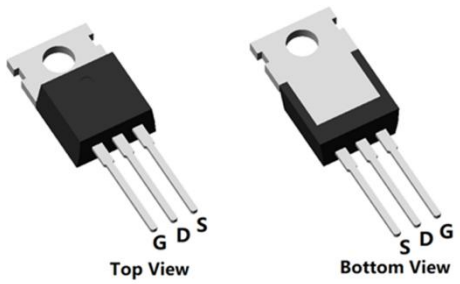
Feature

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

Applications

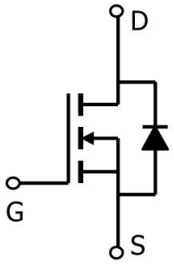
- Power switching application
- DC-DC Converter
- Power Management

Package

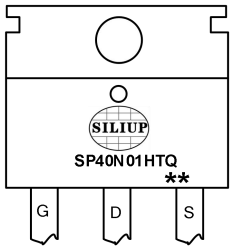


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



SP40N01HTQ : **Product code**
** : **Week code**

Order Information

Device	Package	Unit/Tube
SP40N01HTQ	TO-220-3L	50

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

Parameter		Symbol	Rating	Unit
Drain source voltage		V_{DS}	40	V
Gate source voltage		V_{GS}	±20	V
Continuous drain current(Tc=25℃)	Silicon Limit	I_D	435	A
	Package Limit	I_D	200	A
Continuous drain current(Tc=100℃)		I_D	140	A
Pulsed drain current		I_{DM}	800	A
Single pulsed avalanche energy[1]		E_{AS}	711	mJ
Power dissipation(Tc=25℃)		P_D	309	W
Thermal resistance, junction-case		$R_{\theta JC}$	0.4	℃/W
Storage Temperature Range		T_{STG}	-55 to 150	℃
Operating Junction Temperature Range		T_J	-55 to 150	℃

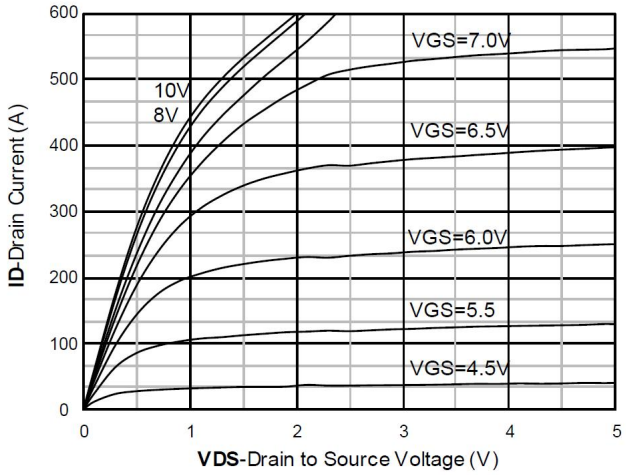
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	40	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS=32V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =250uA	2	3	4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=10V , ID=30A	-	1.9	2.35	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=20V , VGS=0V , f=1MHz	-	9263	-	pF
Output Capacitance	C_{oss}		-	650	-	
Reverse Transfer Capacitance	C_{rss}		-	640	-	
Total Gate Charge	Q_g	VDS=20V , VGS=10V , ID=30A	-	138	-	nC
Gate-Source Charge	Q_{gs}		-	19	-	
Gate-Drain Charge	Q_{gd}		-	31	-	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDD=20V, VGS=10V , RG=2.7Ω, ID=30A	-	26	-	ns
Rise Time	T_r		-	30	-	
Turn-Off Delay Time	$T_{d(off)}$		-	59	-	
Fall Time	T_f		-	19	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Diode Continuous Current	I_S		-	-	200	A
Reverse recover time	T_{rr}	I_{SD}=190A, di/dt=100A/us, Tj=25℃	-	53	-	ns
Reverse recovery charge	Q_{rr}		-	29	-	nC

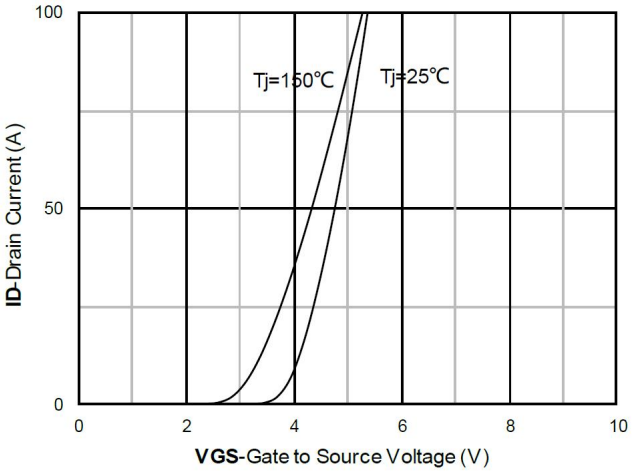
Note:

1. E_{AS} is tested at starting Tj = 25℃, V_{DD}=75V,V_{GS} = 10V,L = 0.5mH, Rg=25Ω;

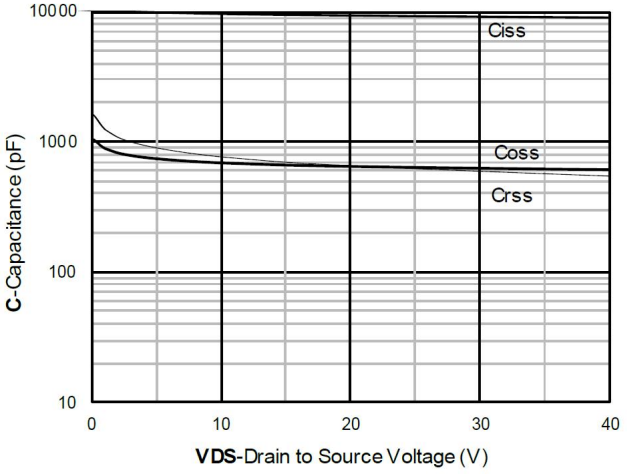
Typical Characteristics



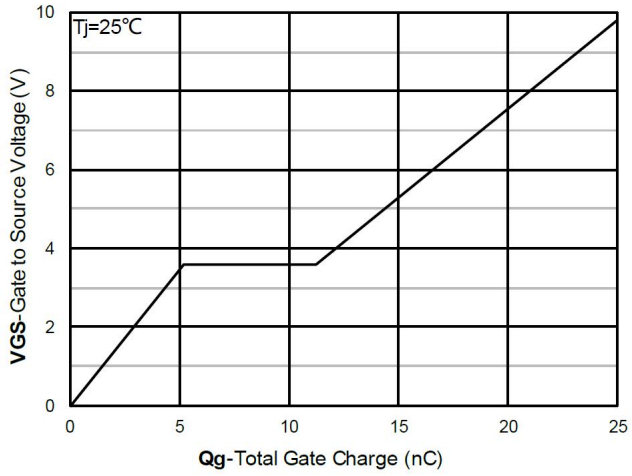
Output Characteristics



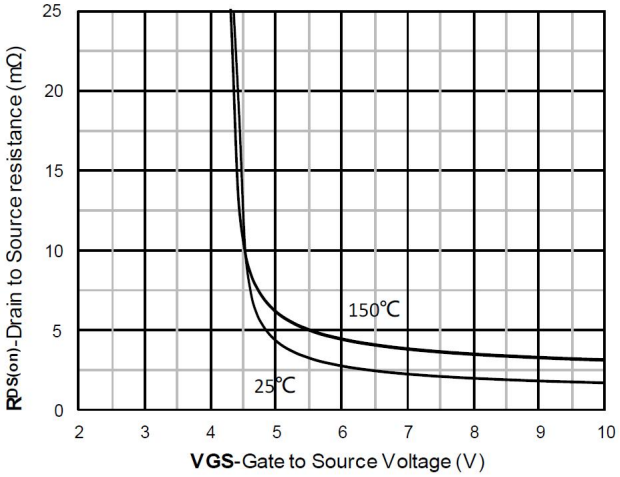
Transfer Characteristics



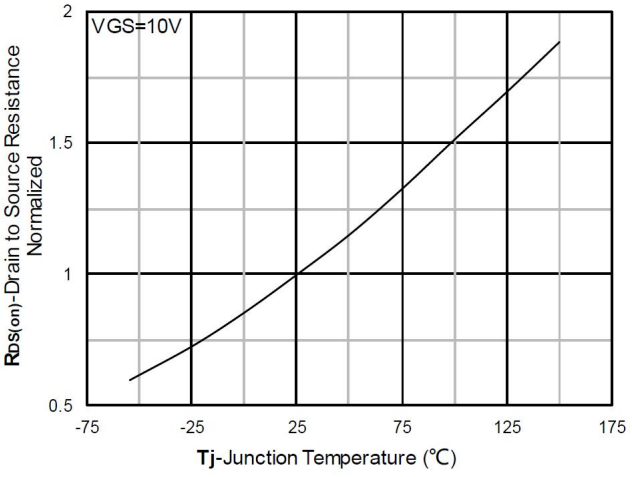
Capacitance Characteristics



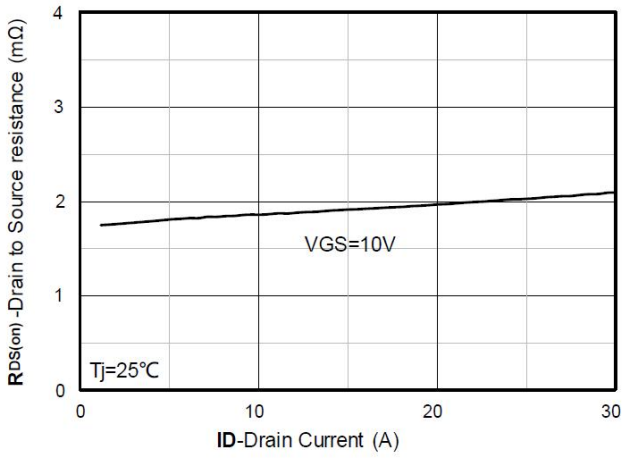
Gate Charge



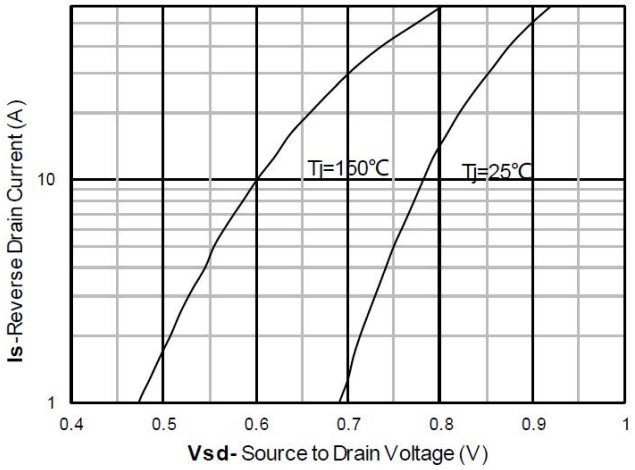
On-Resistance vs Gate to Source Voltage



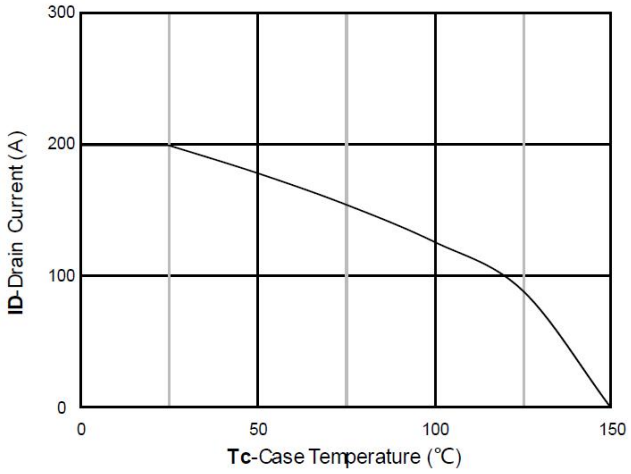
Normalized On-Resistance



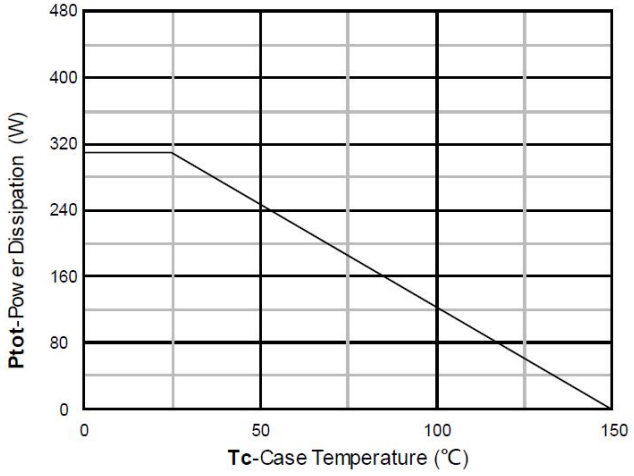
RDS(on) VS Drain Current



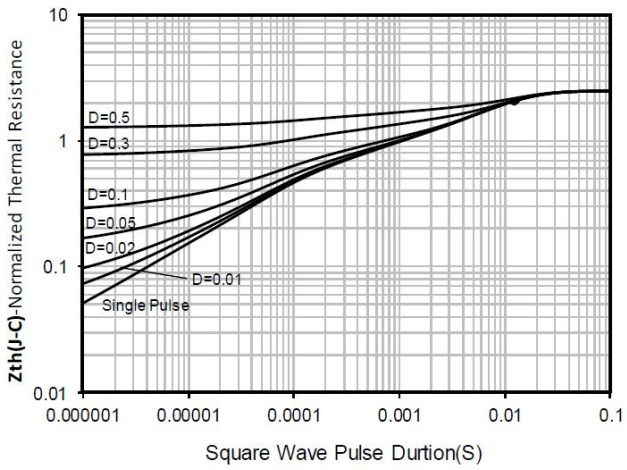
Forward characteristics of reverse diode



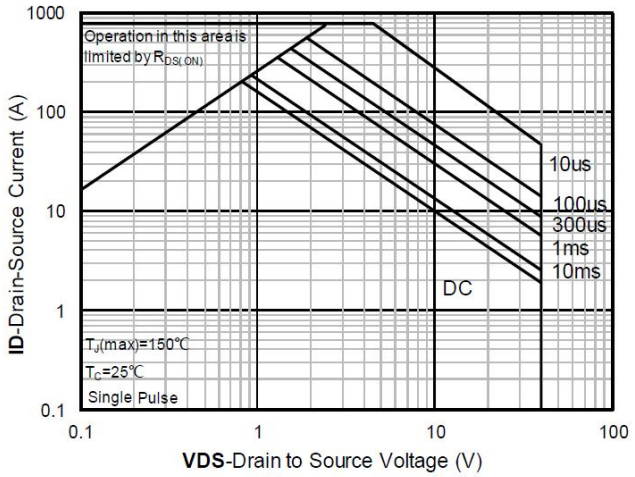
Current dissipation



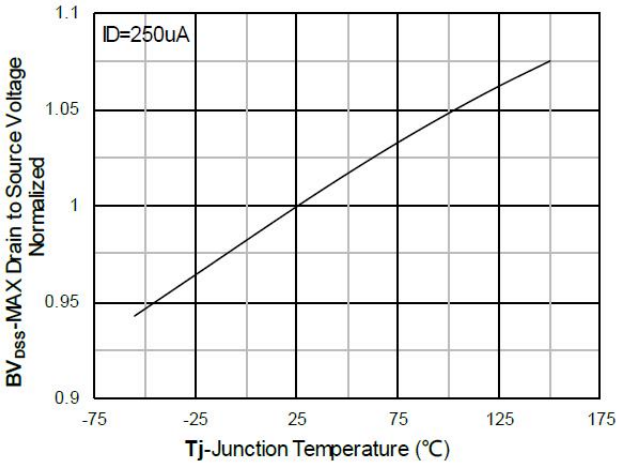
Power dissipation



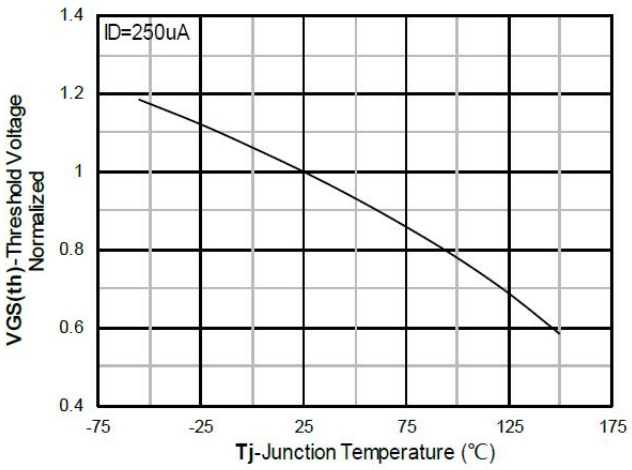
Maximum Transient Thermal Impedance



Safe Operation Area

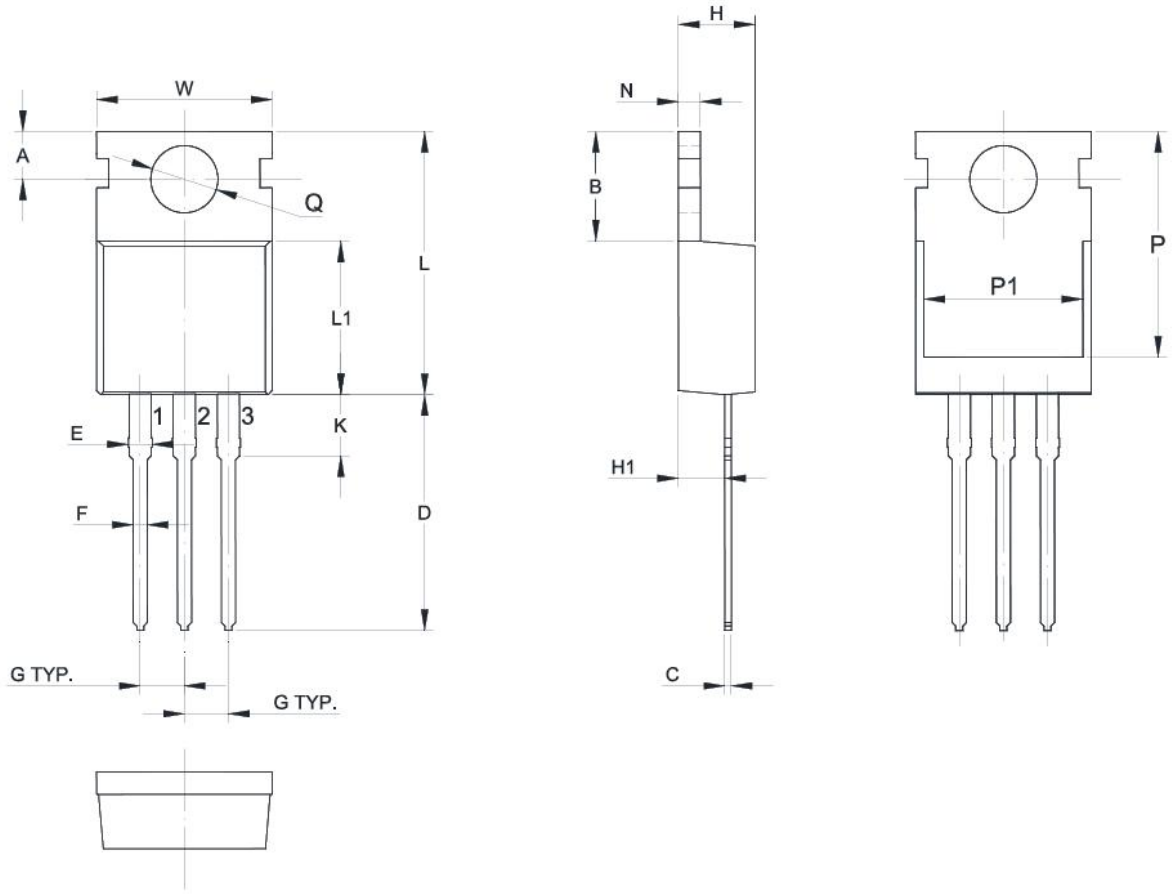


Normalized breakdown voltage



Normalized Threshold voltage

TO-220-3L Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	2.700	2.900
B	6.400	6.800
C	0.300	0.700
D	11	15
E	1.1	1.5
F	0.7	0.9
G	2.54TYP	
W	9.8	10.2
H	4.3	4.7
H1	2.2	2.5
K	2.7	3.1
L	14.8	16.8
L1	9.0	9.4
N	1.2	1.4
P	12.7	13.3
P1	7.6	8.2
Q	3.5	3.7