

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	13mΩ@10V	7A
	18mΩ@4.5V	



合肥矽普半导体

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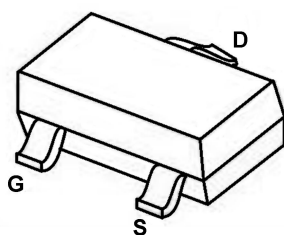
Feature

- High power and current handling capability
- Surface mount package

Application

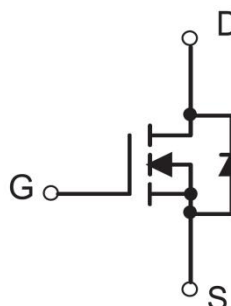
- Battery Switch
- DC/DC Converter

Package

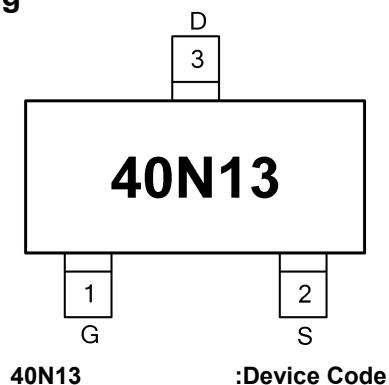


SOT-23-3L

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tape
SP40N13T1	SOT-23-3L	3000

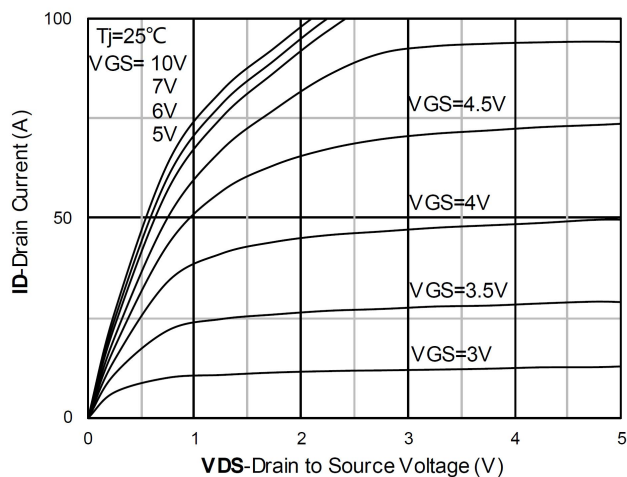
Absolute maximum ratings (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	7	A
Pulse Drain Current Tested	I_{DM}	28	A
Power Dissipation	P_D	1.1	W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	113	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

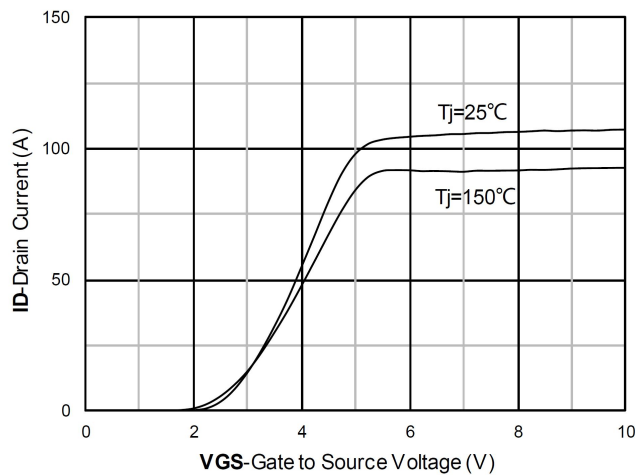
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250μA	40	-	-	V
Drain-Source Leakage Current	I _{DSS}	VDS=32V , VGS=0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS=VGS , ID=250μA	1	1.6	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS=10V , ID =5A	-	13	20	mΩ
		VGS=4.5V , ID =3A	-	18	24	
Dynamic characteristics						
Input Capacitance	C _{iss}	VDS=15V , VGS=0V , f=1MHz	-	1013	-	pF
Output Capacitance	C _{oss}		-	109	-	
Reverse Transfer Capacitance	C _{rss}		-	96	-	
Total Gate Charge	Q _g	VDS=32V , VGS=4.5V , ID=8A	-	22.9	-	nC
Gate-Source Charge	Q _{gs}		-	3.5	-	
Gate-Drain Charge	Q _{gd}		-	5.3	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	VDD=15V VGS=10V , RG=1.5Ω , ID=7A	-	5.5	-	nS
Turn-On Rise Time	t _r		-	14	-	
Turn-Off Delay Time	t _{d(off)}		-	24	-	
Turn-Off Fall Time	t _f		-	12	-	
Source-Drain Diode characteristics						
Diode Forward Voltage	V _{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V

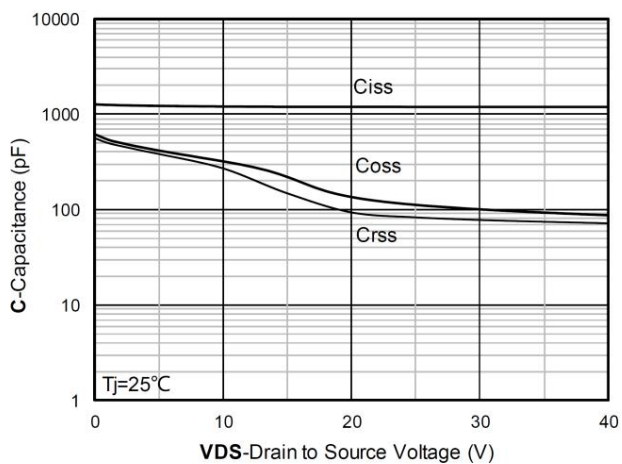
Typical Characteristics



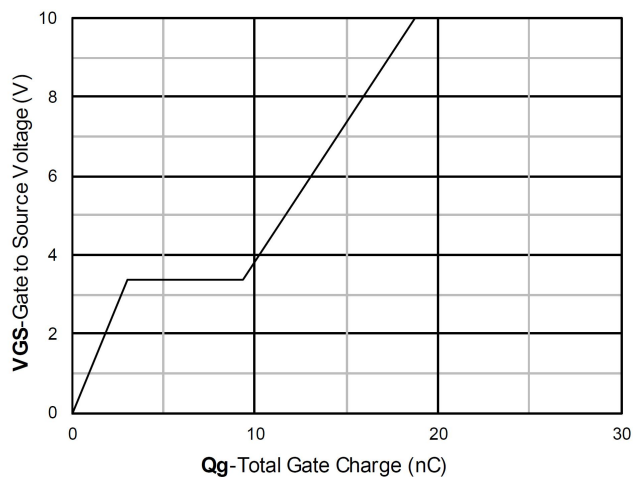
Output Characteristics



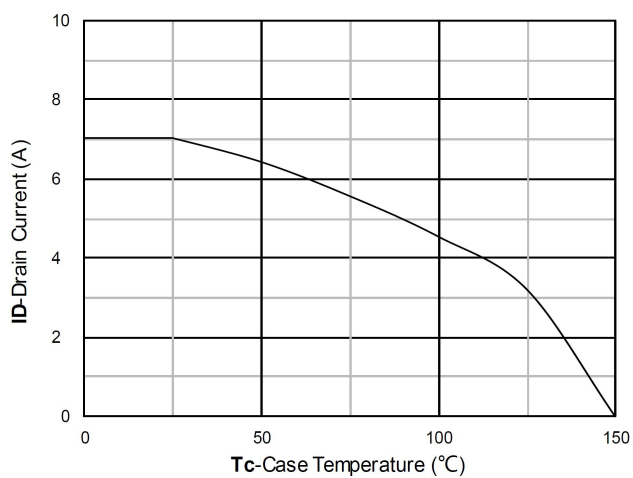
Transfer Characteristics



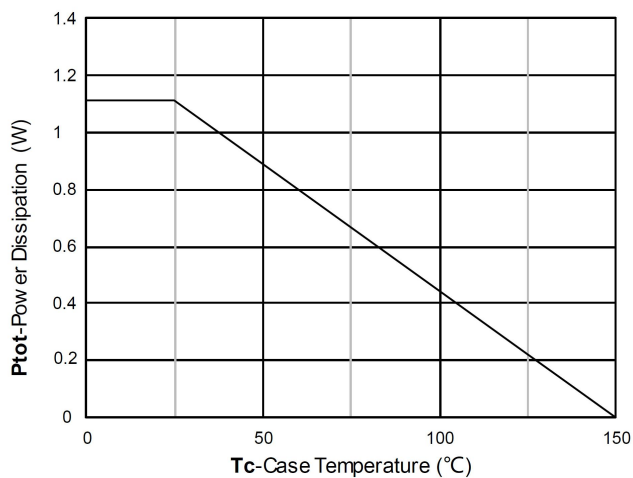
Capacitance Characteristics



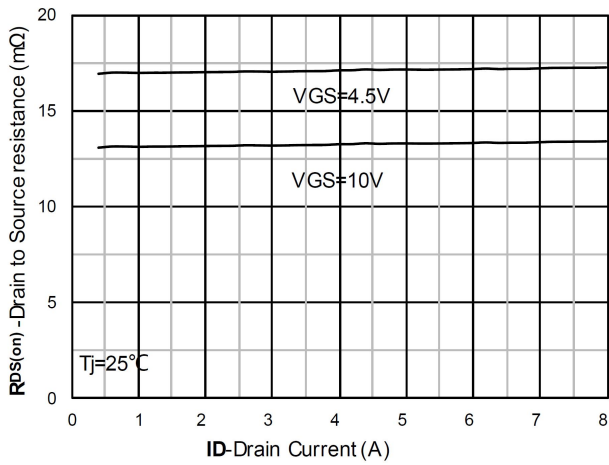
Gate Charge



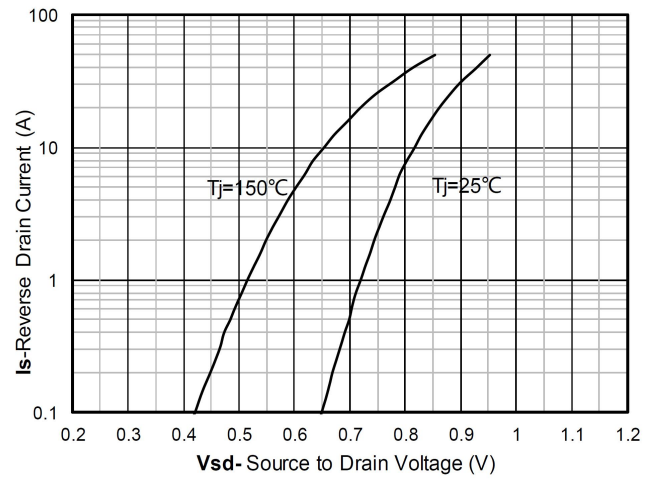
Current dissipation



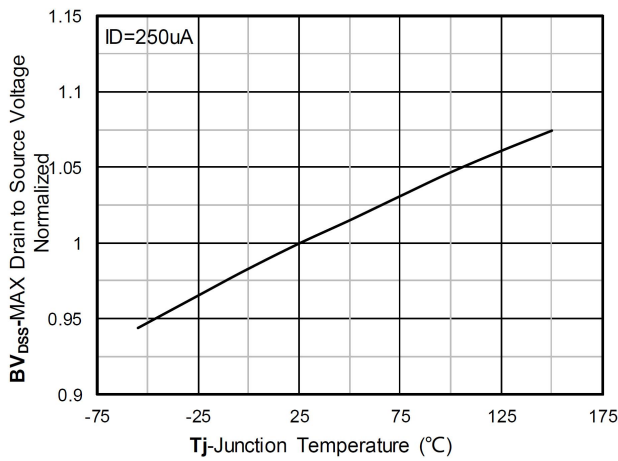
Power dissipation



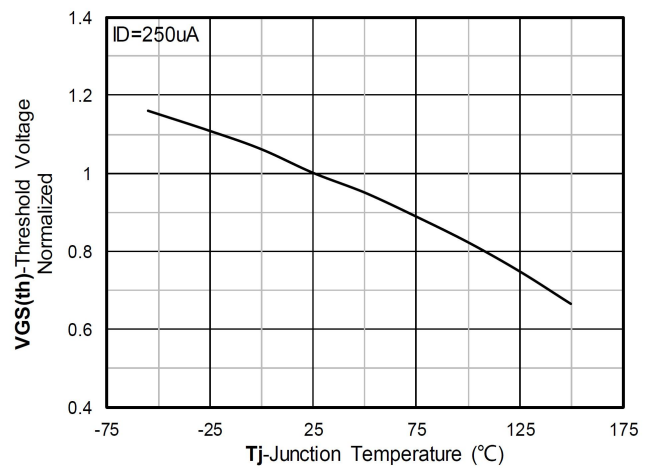
RDS(on) VS Drain Current



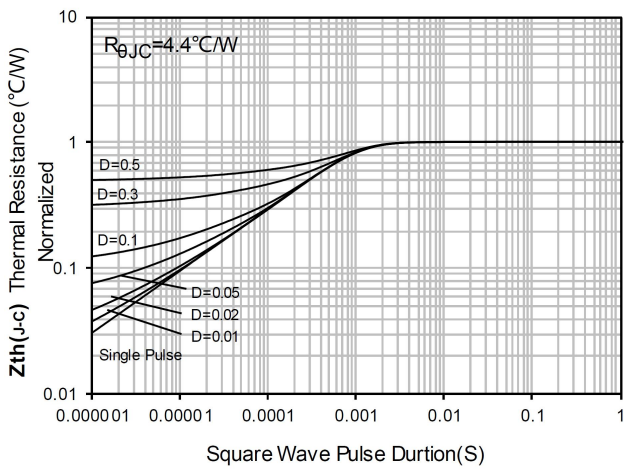
Forward characteristics of reverse diode



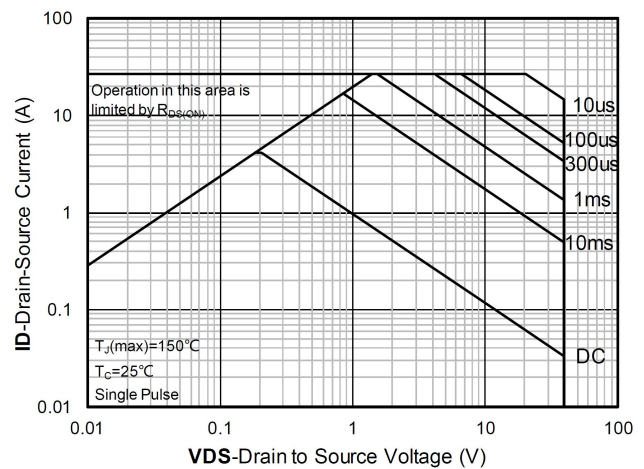
Normalized breakdown voltage



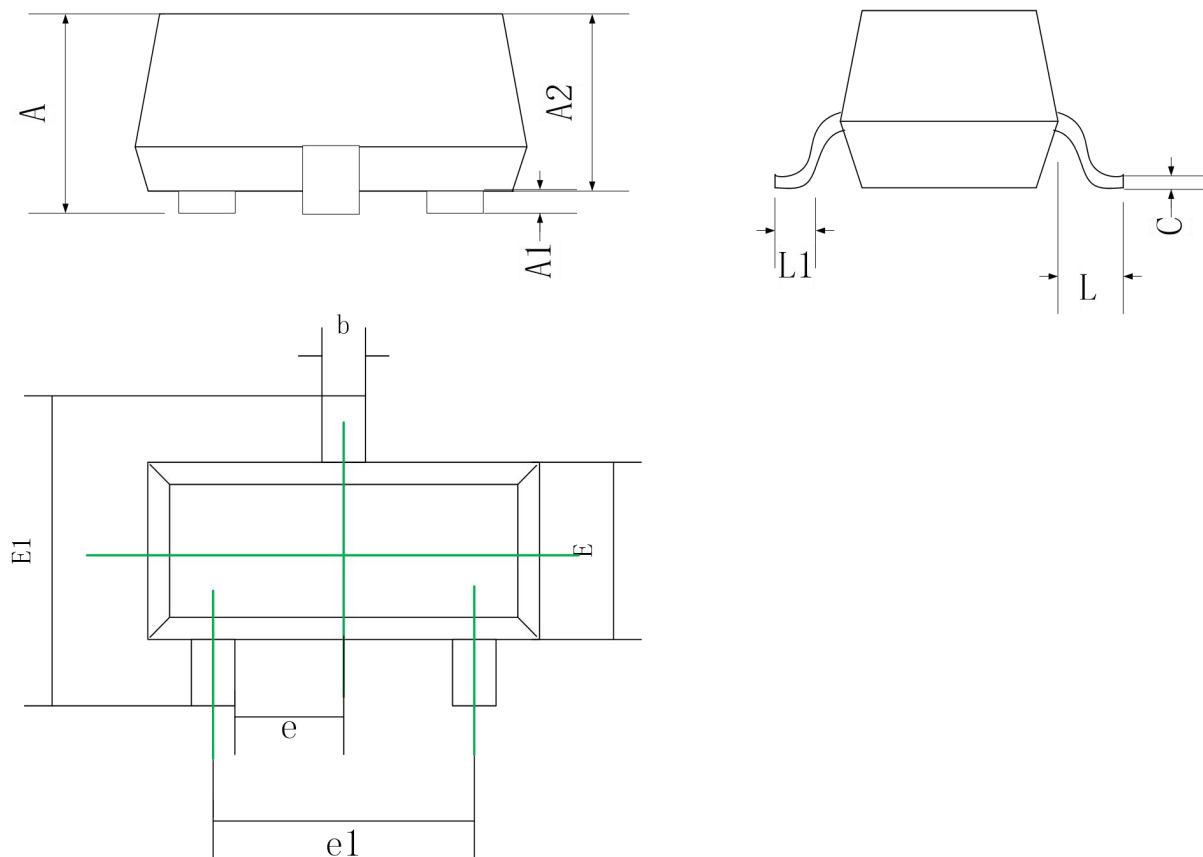
Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

SOT-23-3L Package Information


Symbol	Dimensions in millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 Typ.	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°