

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
500V	$0.21\Omega@10V$	25A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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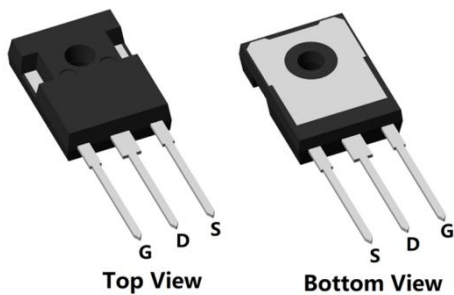
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- 100% Single Pulse avalanche energy Test

Applications

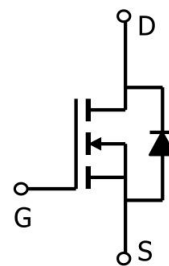
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

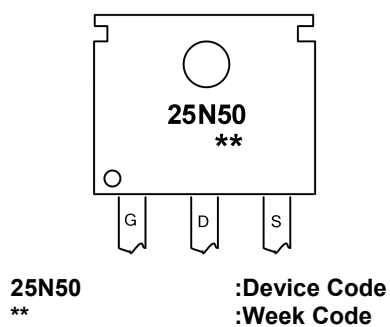


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP25N50TF	TO-247	30

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current (Tc=25°C)	I_D	25	A
Continuous Drain Current (Tc=100°C)	I_D	16.6	A
Pulsed Drain Current	I_{DM}	100	A
Single Pulse Avalanche Energy ¹	E_{AS}	1620	mJ
Power Dissipation (Tc=25°C)	P_D	300	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.42	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

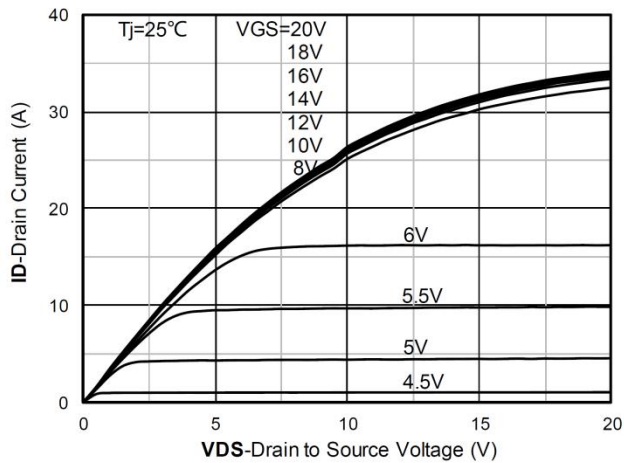
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID = 250μA, VGS = 0V	500	-	-	V
Drain Cut-Off Current	IDSS	VDS = 400V, VGS = 0V	-	-	1	μA
Gate Leakage Current	IGSS	VGS = ±30V, VDS = 0V	-	-	±100	nA
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 = 12A	-	0.21	0.26	Ω
Dynamic Characteristics						
Input Capacitance	Ciss	VDS =25V, VGS = 0V, f = 1.0MHz	-	3468	-	pF
Output Capacitance	Coss		-	217	-	
Reverse Transfer Capacitance	Crss		-	12	-	
Total Gate Charge	Qg	VDS=400V , VGS=10V , ID=20A	-	63	-	nC
Gate-Source Charge	Qgs		-	16	-	
Gate-Drain Charge	Qgd		-	24	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VGS = 250V, VDS =10V, RG=25Ω, ID=12A	-	37	-	nS
Rise Time	tr		-	64	-	
Turn-Off Delay Time	td(off)		-	86	-	
Fall Time	tf		-	46	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	Is = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	25	A
Body Diode Reverse Recovery Time	Trr	Is = 25A, dIf/dt = 100A/us	-	495	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	6250	-	nC

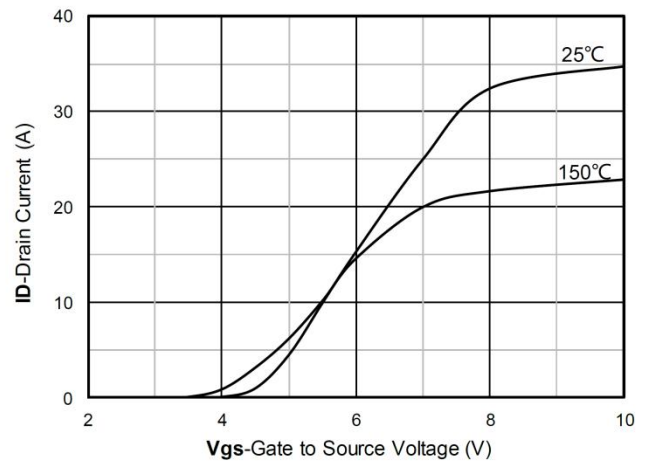
Note :

- The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 10mH, R_G = 30\Omega$;

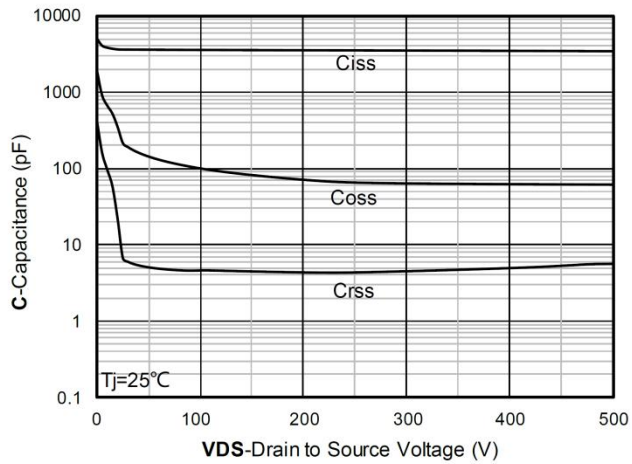
Typical Characteristics



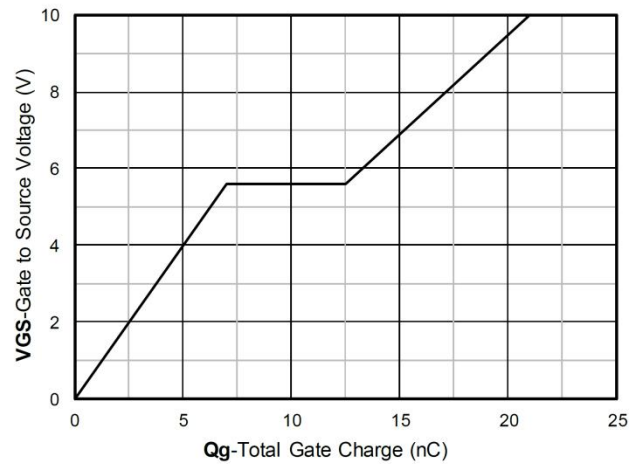
Output Characteristics



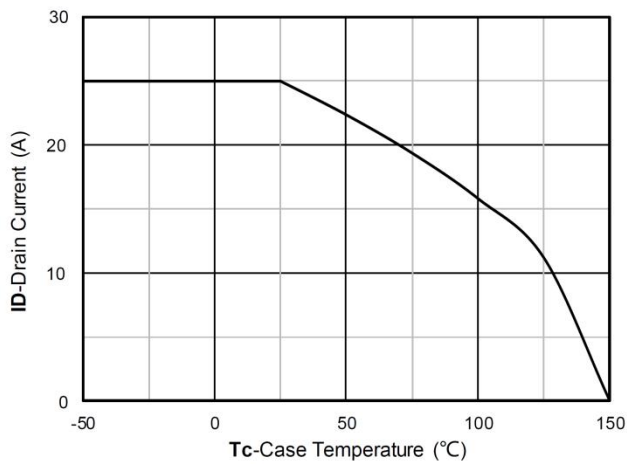
Transfer Characteristics



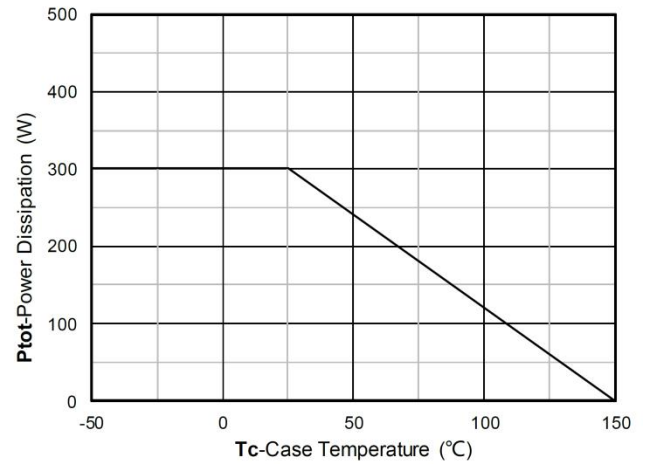
Capacitance Characteristics



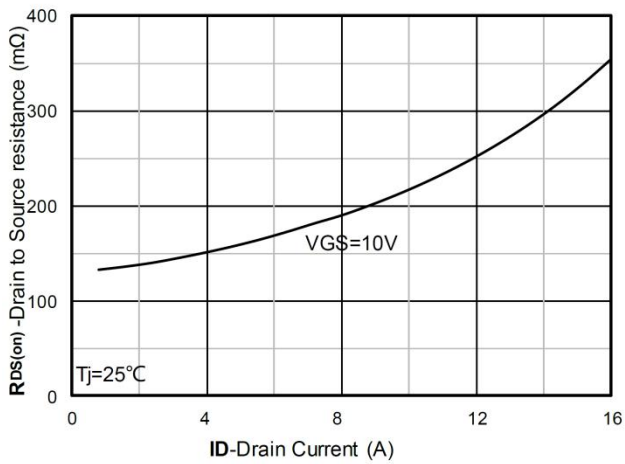
Gate Charge



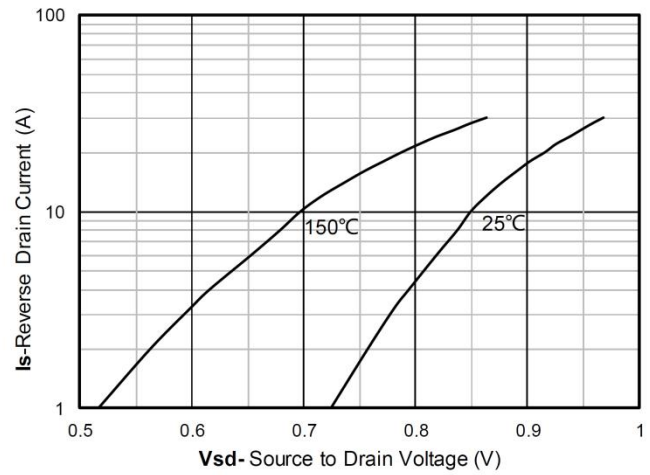
Current dissipation



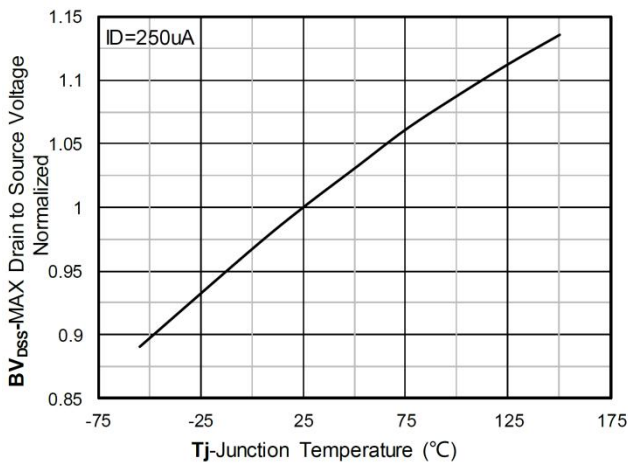
Power dissipation



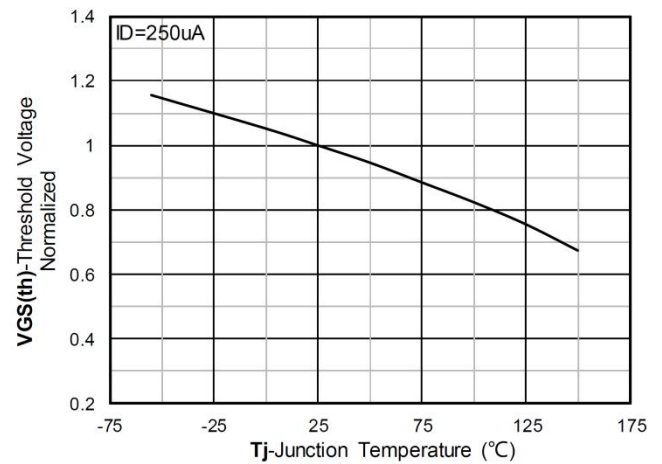
RDS(on) VS Drain Current



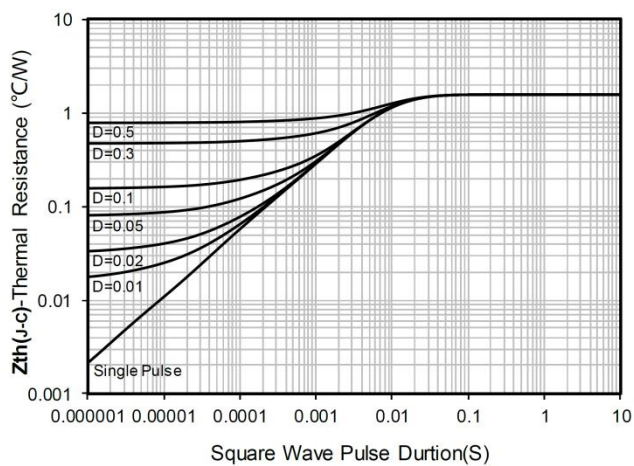
Forward characteristics of reverse diode



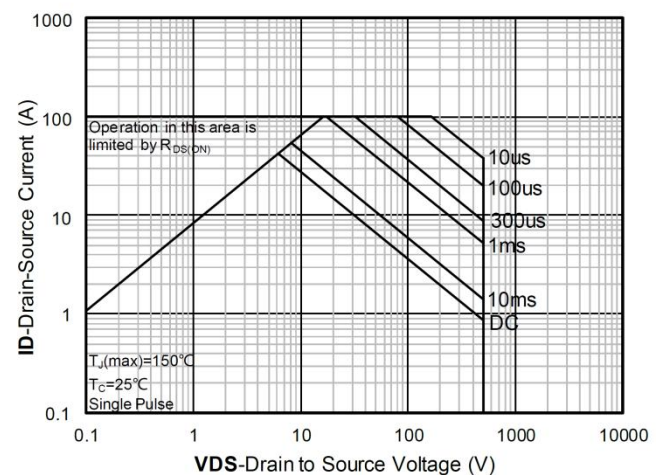
Normalized breakdown voltage



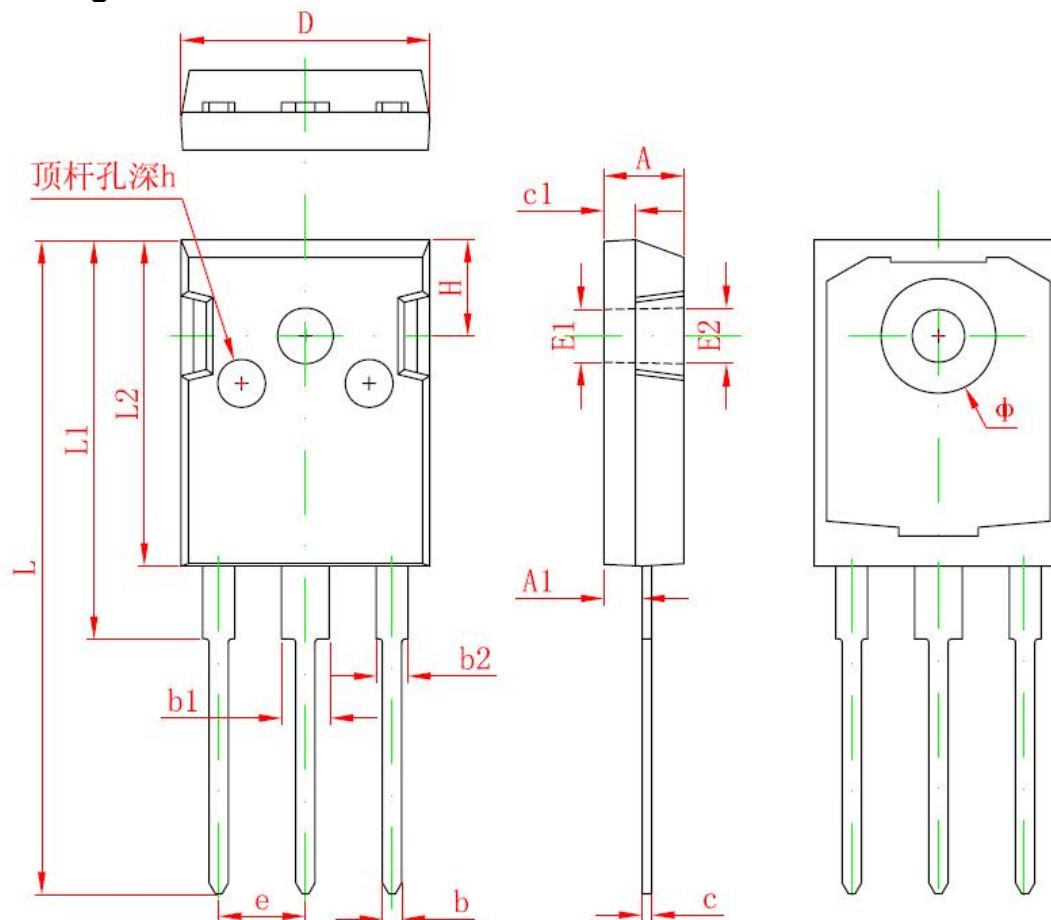
Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

TO-247 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b2	1.800	2.200	0.071	0.087
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF.		0.138 REF.	
E2	3.600 REF.		0.142 REF.	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP.		0.215 TYP.	
H1	5.980 REF.		0.235 REF.	
h	0.000	0.300	0.000	0.012