

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
200V	33mΩ@10V	50A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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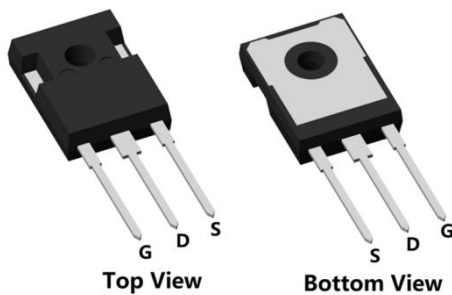
Feature

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

Applications

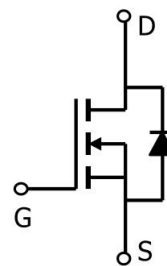
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

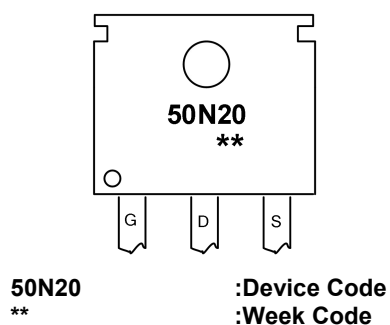


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP50N20TF	TO-247	30

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	50	A
Continuous Drain Current (Tc=100°C)	I_D	33.3	A
Pulsed Drain Current	I_{DM}	200	A
Single Pulse Avalanche Energy ¹	E_{AS}	3920	mJ
Power Dissipation (Tc=25°C)	P_D	300	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.416	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

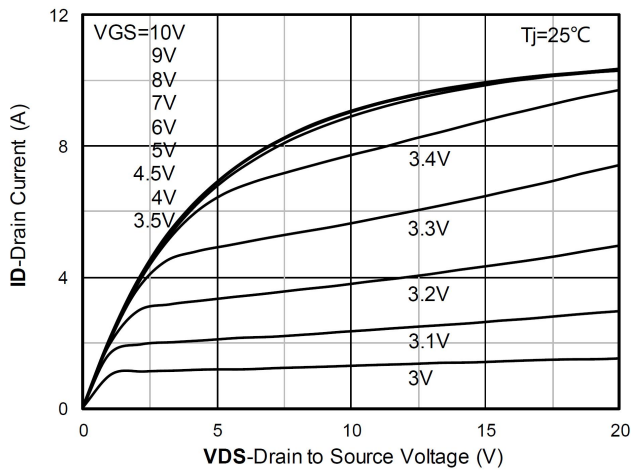
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID = 250μA, VGS = 0V	200	-	-	V
Drain Cut-Off Current	IDSS	VDS = 160V, VGS = 0V	-	-	25	μA
Gate Leakage Current	IGSS	VGS = ±20V, 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 = 26A	-	33	41	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VDS =25V, VGS = 0V, f = 1.0MHz	-	4850	-	pF
Output Capacitance	Coss		-	750	-	
Reverse Transfer Capacitance	Crss		-	76	-	
Total Gate Charge	Qg	VDS=100V , VGS=10V , ID=26A	-	66	-	nC
Gate-Source Charge	Qgs		-	18.5	-	
Gate-Drain Charge	Qgd		-	29	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VGS = 250V, VDS =10V, RG=10Ω, ID=20A	-	28	-	nS
Rise Time	tr		-	47	-	
Turn-Off Delay Time	td(off)		-	57	-	
Fall Time	tf		-	40	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	Is = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	50	A
Body Diode Reverse Recovery Time	Trr	Is = 30A, dIf/dt = 100A/us	-	185	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	755	-	nC

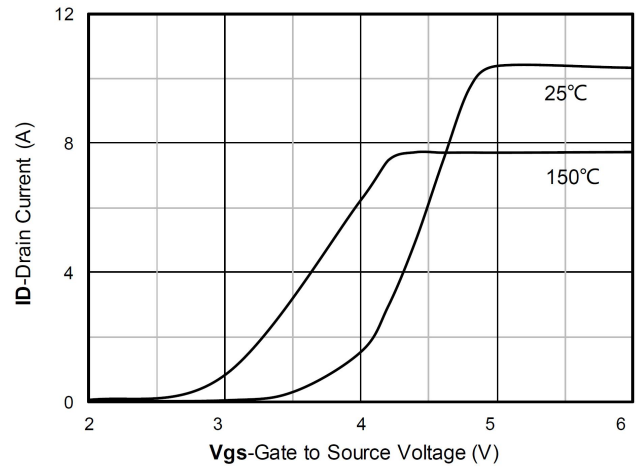
Note :

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

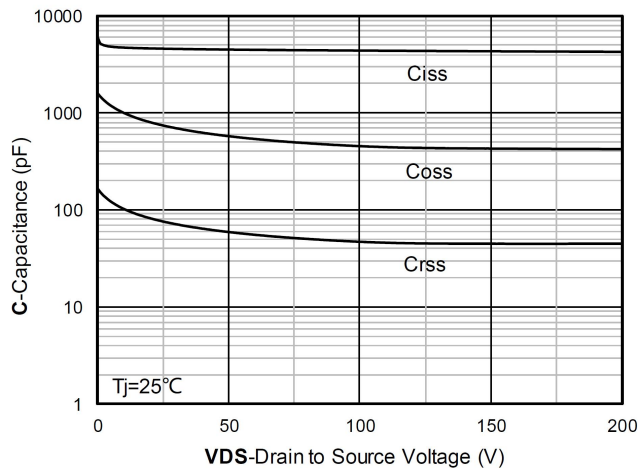
Typical Characteristics



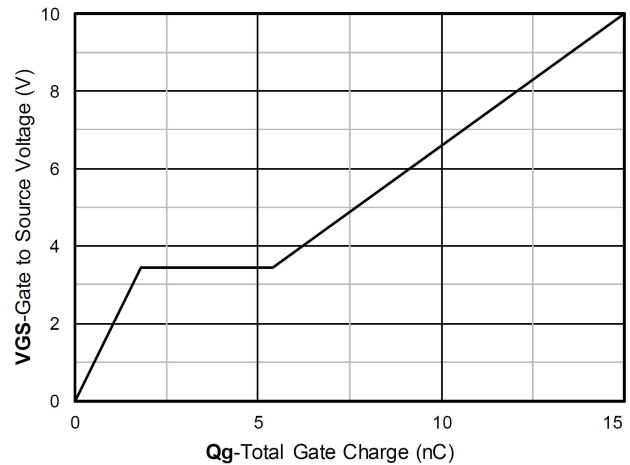
Output Characteristics



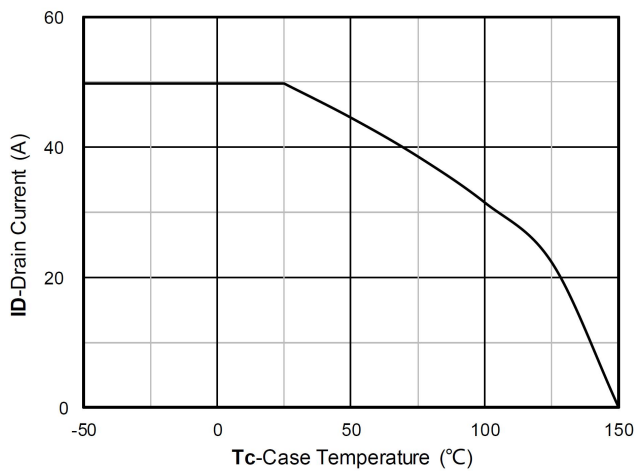
Transfer Characteristics



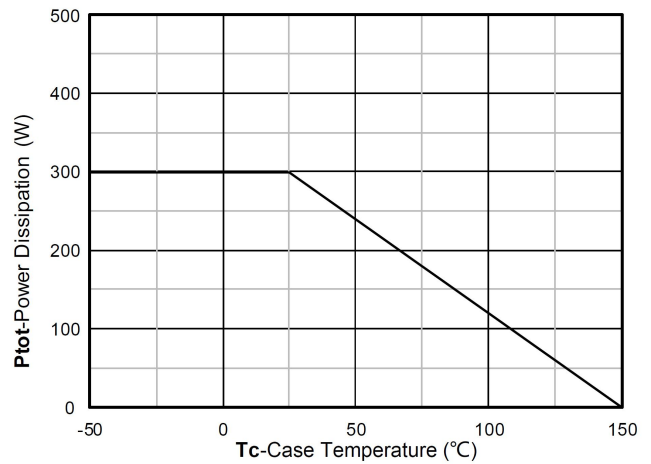
Capacitance Characteristics



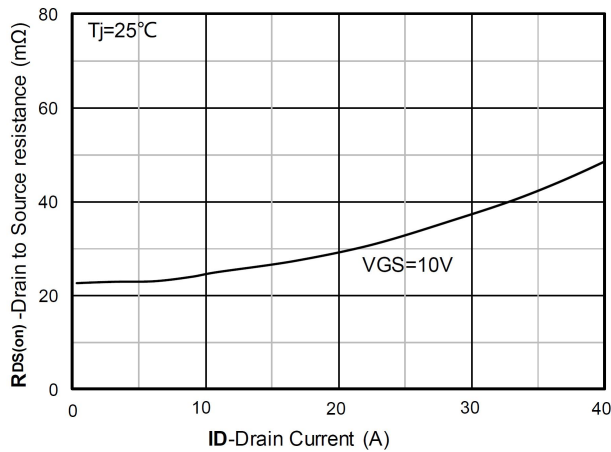
Gate Charge



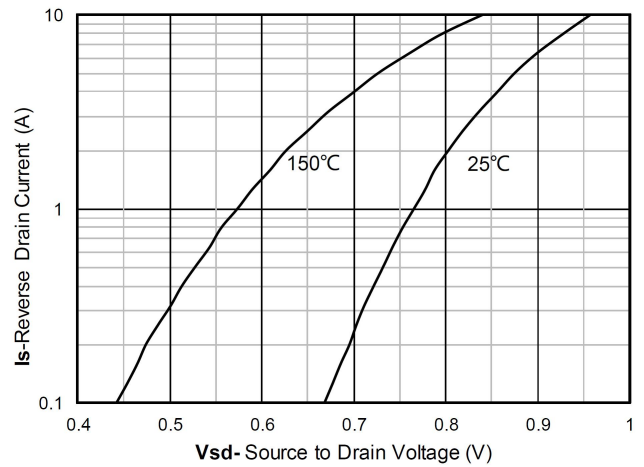
Current dissipation



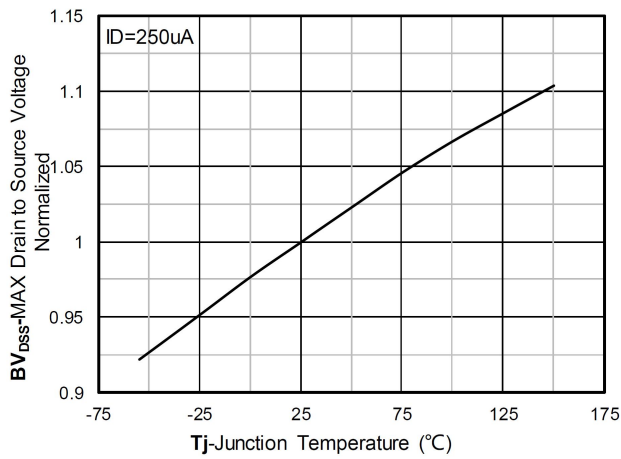
Power dissipation



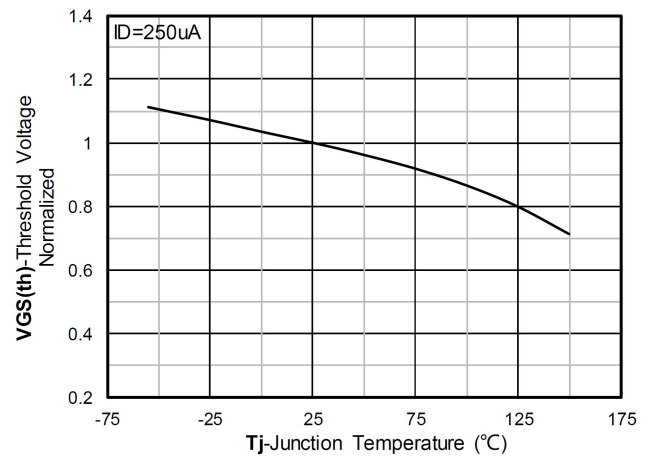
$R_{DS(on)}$ VS Drain Current



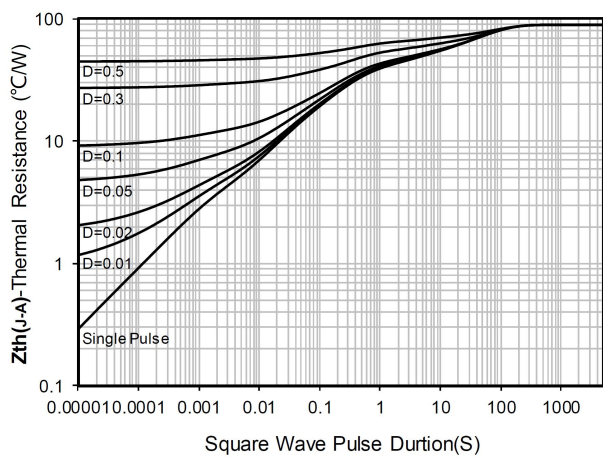
Forward characteristics of reverse diode



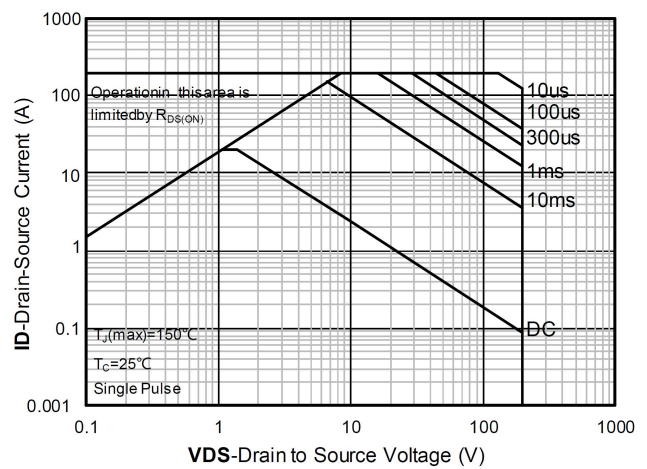
Normalized breakdown voltage



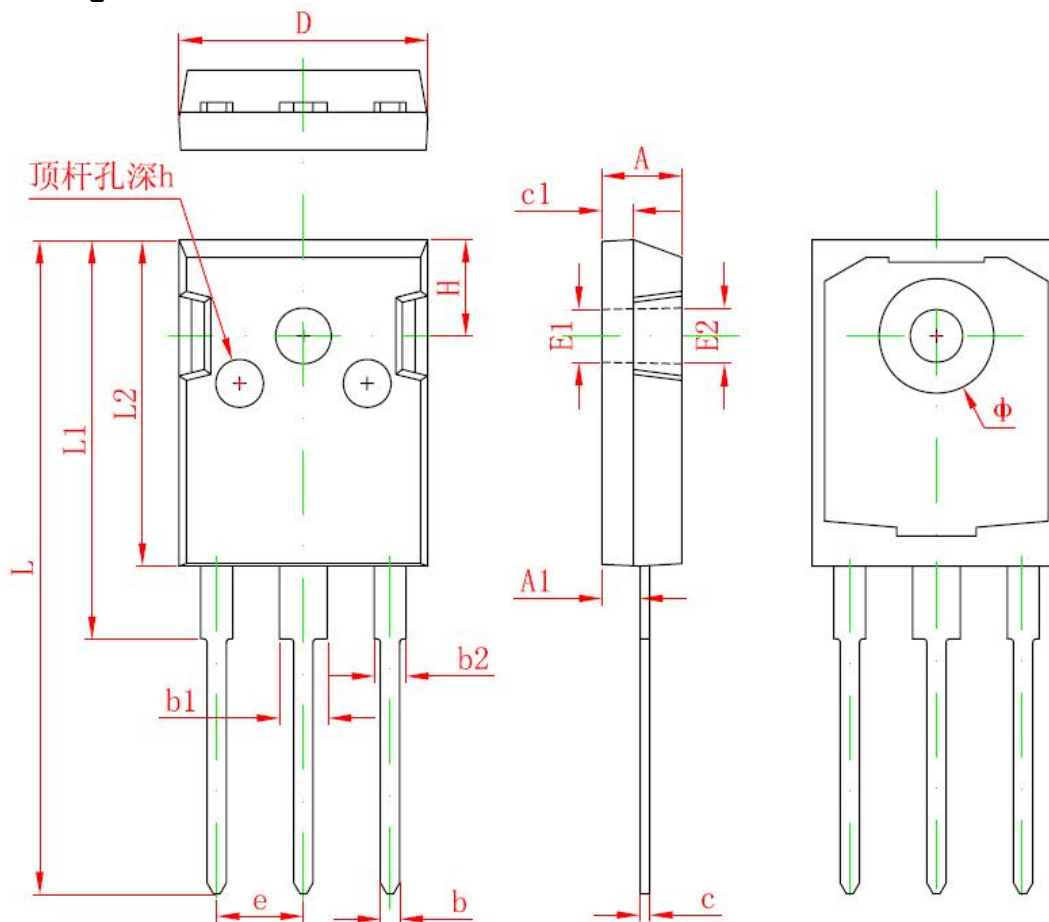
Normalized Threshold voltage



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