Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
500V	1.33Ω@10V	5A

合肥矽普半导体
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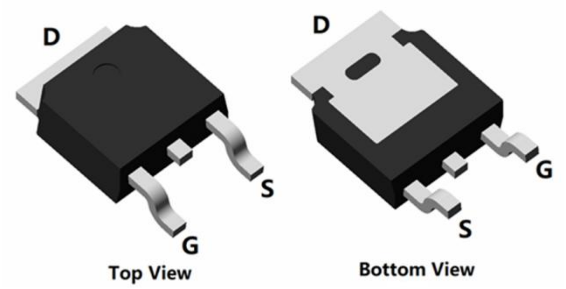
Feature

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

Applications

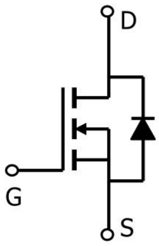
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

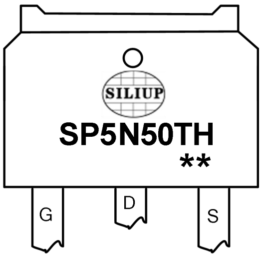


TO-252(1:G 2:D 3:S)

Circuit diagram



Marking



SP5N50TH	**:Device Code**
******	**:Week Code**

Order Information

Device	Package	Unit/Tape
SP5N50TH	TO-252	2500

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current (T_C=25℃)	I_D	5	A
Continuous Drain Current (T_C=100℃)	I_D	3.4	A
Pulsed Drain Current	I_{DM}	20	A
Single Pulse Avalanche Energy[1]	E_{AS}	255	mJ
Power Dissipation (T_C=25℃)	P_D	78	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.6	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

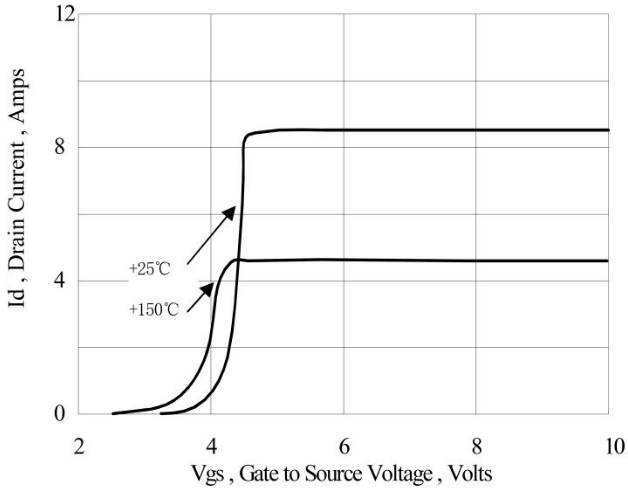
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	500	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS=400V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	VGS=±30V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =250uA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=10V , ID=2A	-	1.33	1.55	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=25V , VGS=0V , f=1MHz	-	608	-	pF
Output Capacitance	C_{oss}		-	64	-	
Reverse Transfer Capacitance	C_{rss}		-	7	-	
Total Gate Charge	Q_g	VDS=400V , VGS=10V , ID=2A	-	12.7	-	nC
Gate-Source Charge	Q_{gs}		-	3.3	-	
Gate-Drain Charge	Q_{gd}		-	4.5	-	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDD=400V VGS=10V , RG=25Ω, ID=2A	-	13	-	nS
Rise Time	T_r		-	17	-	
Turn-Off Delay Time	$T_{d(off)}$		-	45	-	
Fall Time	T_f		-	26	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	5	A
Reverse Recovery Time	T_{rr}	I_S=2A, di/dt=100A/us, TJ=25℃	-	304	-	nS
Reverse Recovery Charge	Q_{rr}		-	1.5	-	uC

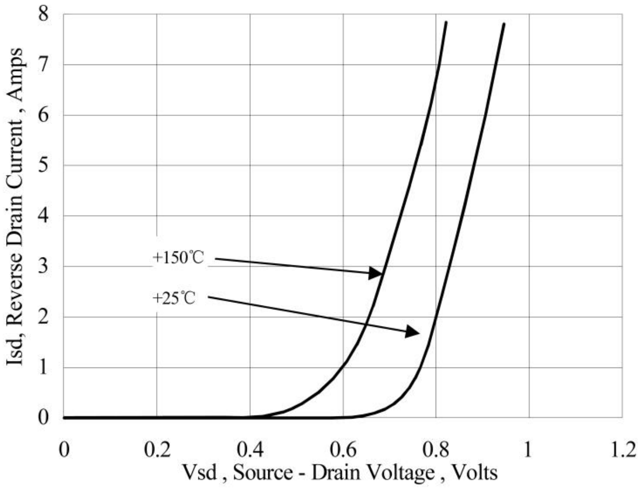
Note :

1. The EAS test condition is VDD=50V,VGS=10V,L=10mH,RG=25Ω

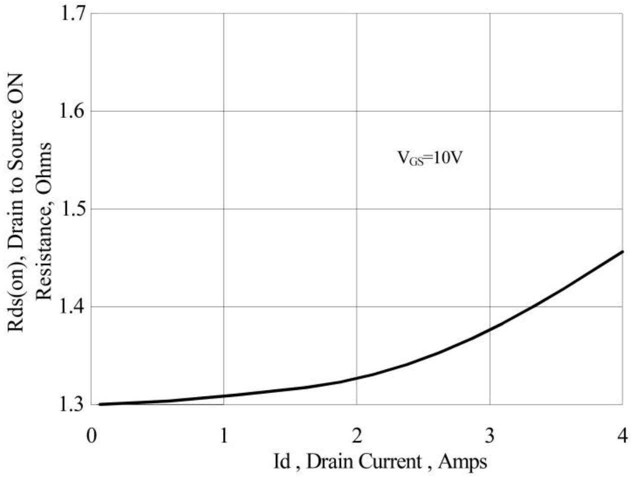
Typical Characteristics



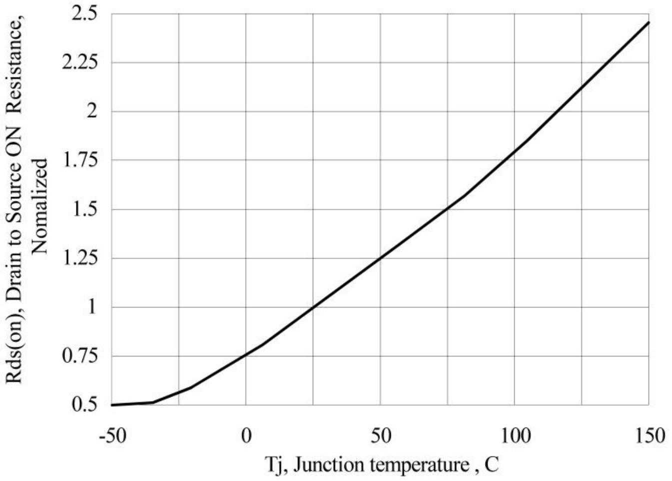
Typical Transfer Characteristics



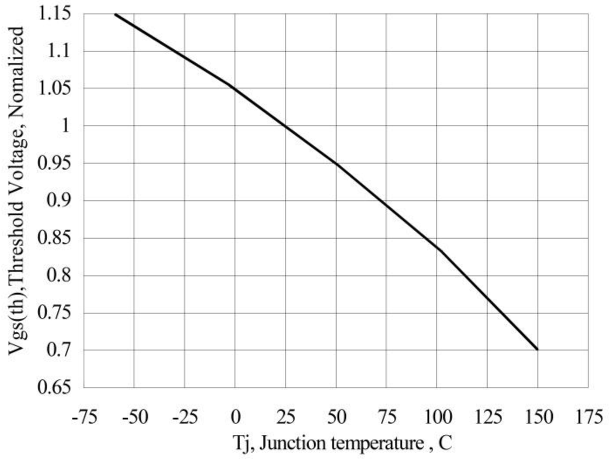
Typical Body Diode Transfer Characteristics



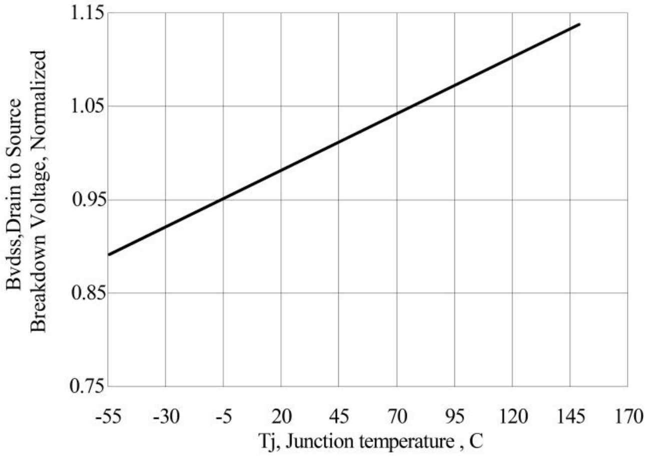
Typical Drain to Source ON Resistance vs Drain Current



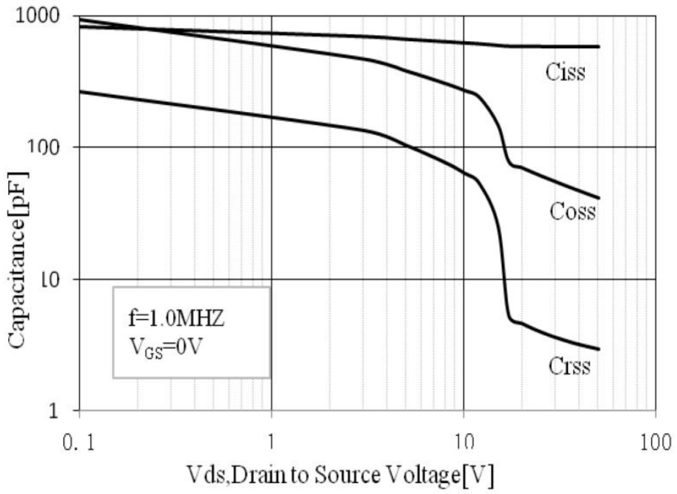
Typical Drain to Source on Resistance vs Junction Temperature



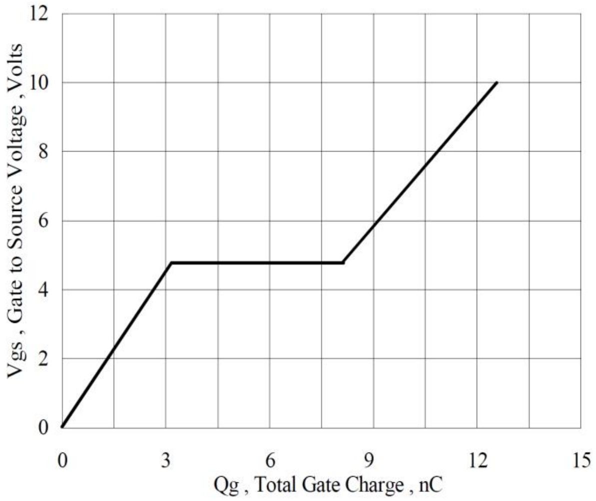
Typical Threshold Voltage vs Junction Temperature



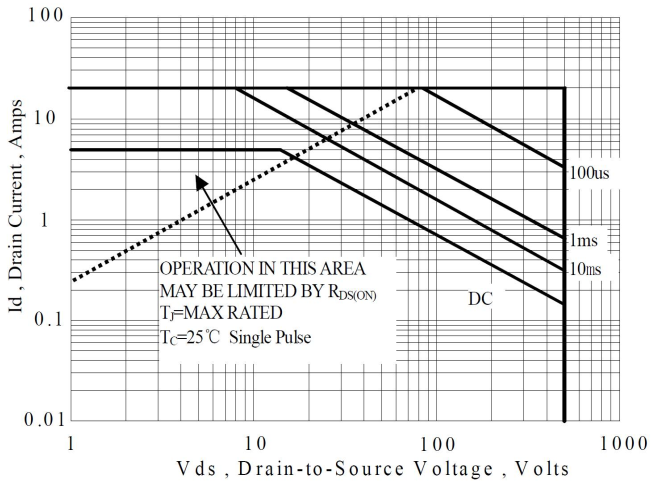
Typical Breakdown Voltage vs Junction Temperature



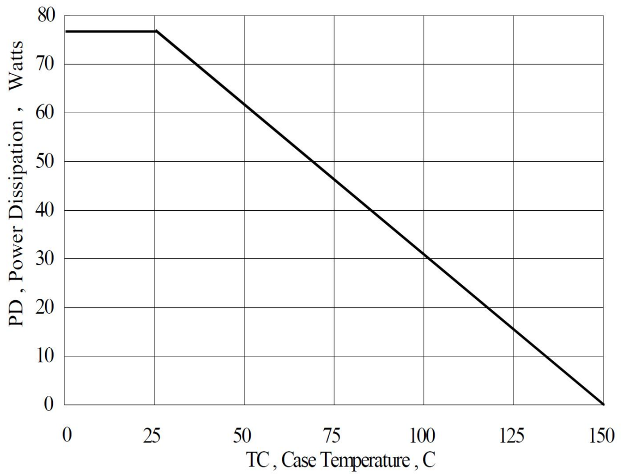
Typical Capacitance vs Drain to Source Voltage



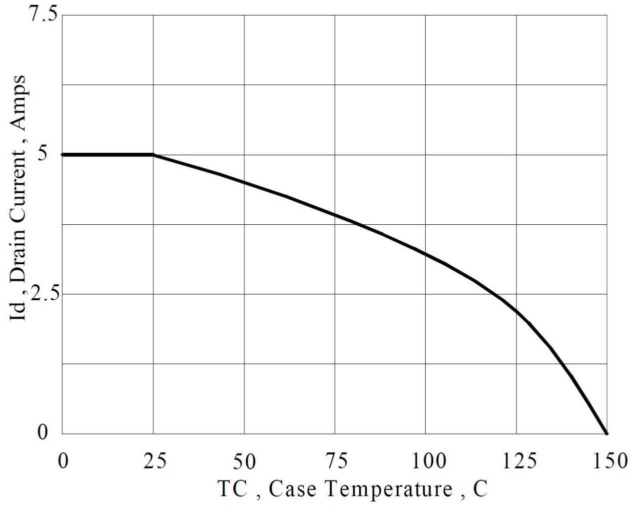
Typical Gate Charge vs Gate to Source Voltage



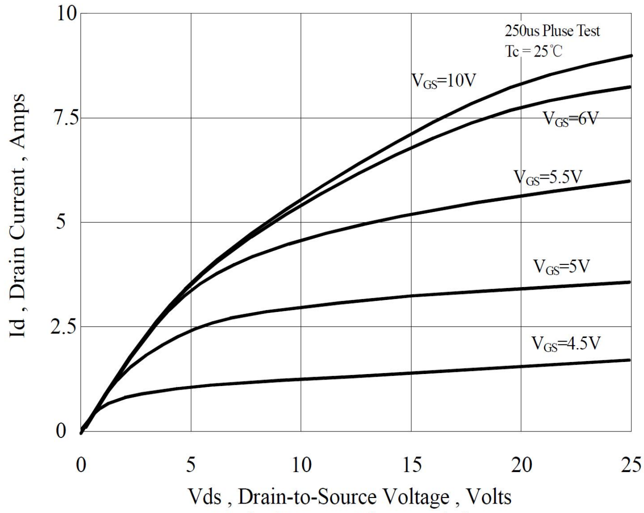
Maximum Forward Bias Safe Operating Area



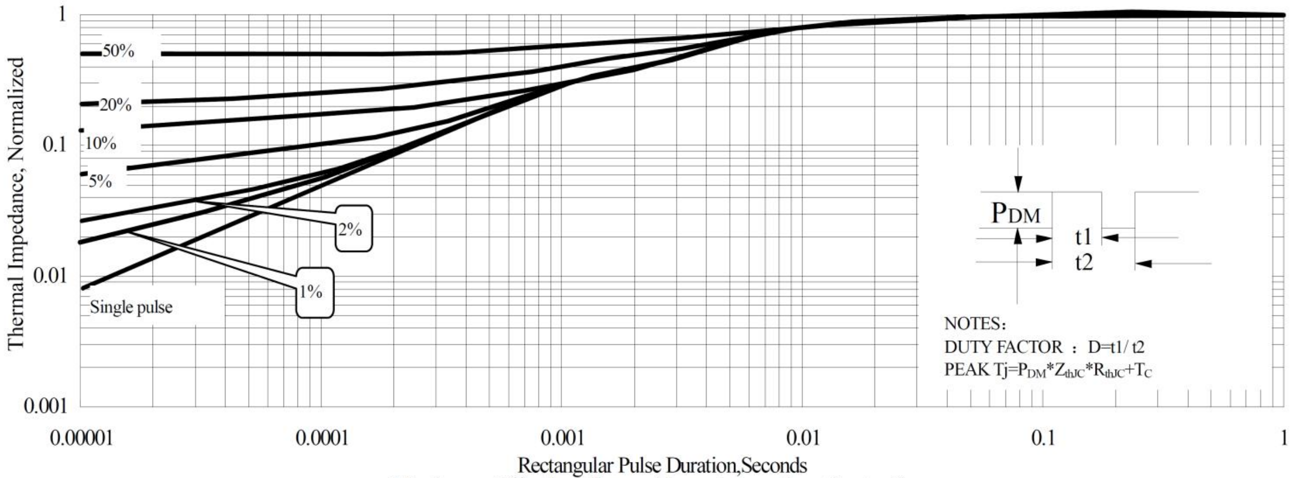
Maximum Power Dissipation vs Case Temperature



Maximum Continuous Drain Current vs Case Temperature

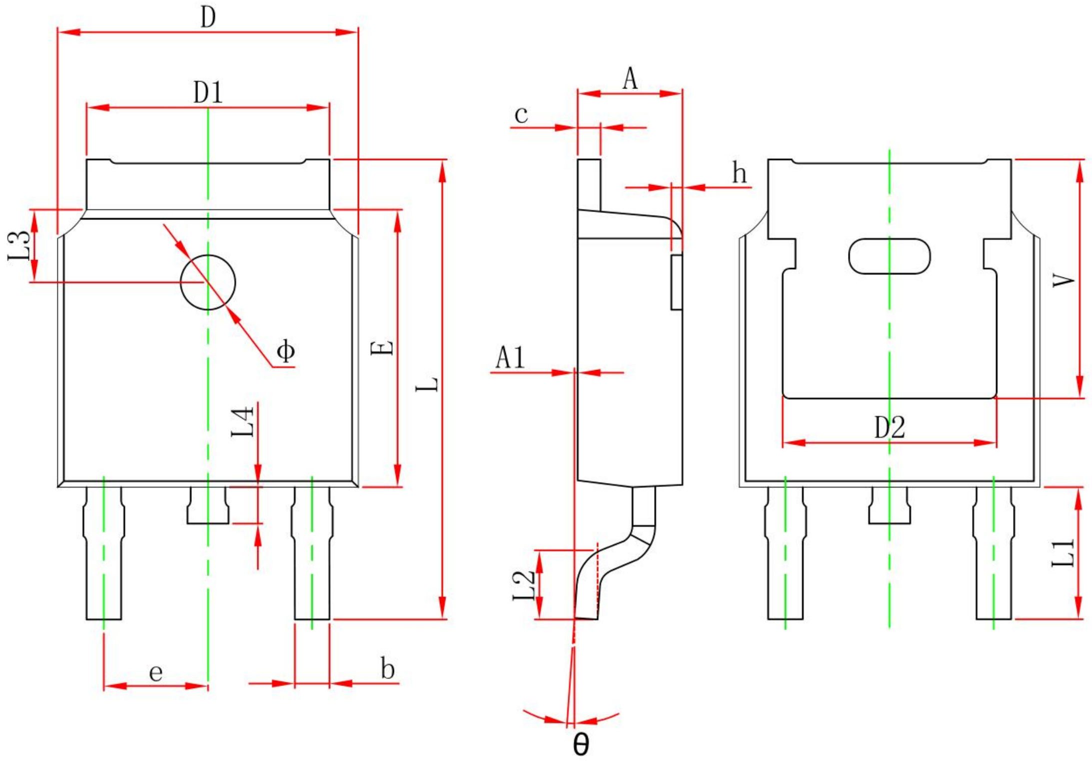


Typical Output Characteristics



Maximum Effective Thermal Impedance , Junction to Case

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
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	