

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
500V	$0.3\Omega@10V$	18A



合肥矽普半导体

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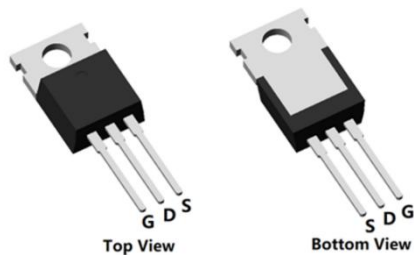
Feature

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

Applications

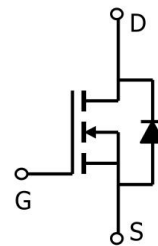
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

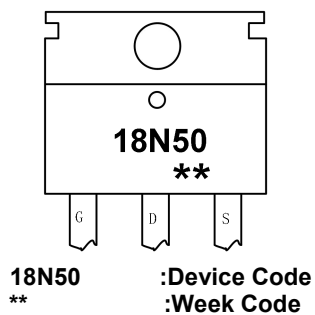


TO-220-3L(G:1 D:2 S:3)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP18N50TQ	TO-220-3L	50

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current (Tc=25°C)	I_D	18	A
Continuous Drain Current (Tc=100°C)	I_D	12	A
Pulsed Drain Current	I_{DM}	72	A
Single Pulse Avalanche Energy ¹	E_{AS}	845	mJ
Power Dissipation (Tc=25°C)	P_D	190	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.65	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

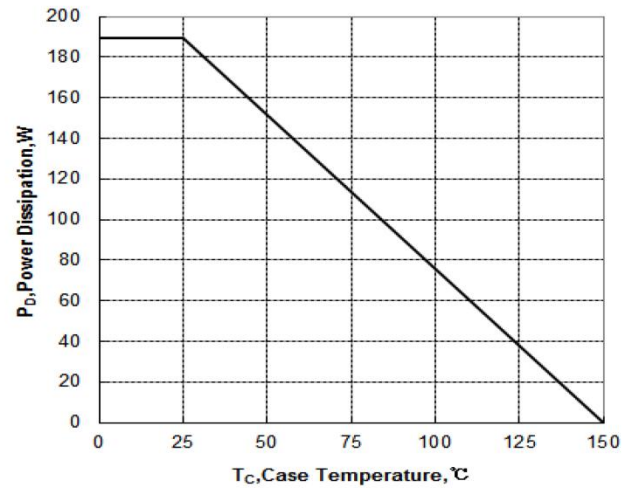
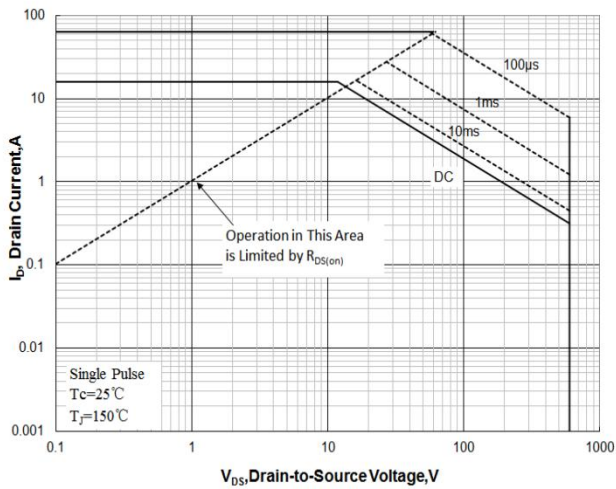
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	B _V DSS	ID = 250μA, VGS = 0V	500	-	-	V
Drain Cut-Off Current	I _{DSS}	VDS = 400V, VGS = 0V	-	-	1	μA
Gate Leakage Current	I _{GSS}	VGS = ±20V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	VDS = VGS, ID = 250μA	3	4	5	V
Drain-Source ON Resistance	R _{DS(ON)}	VGS = 10V, ID = 9A	-	0.3	0.4	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	VDS =50V, VGS = 0V, f = 1.0MHz	-	2620	-	pF
Output Capacitance	C _{oss}		-	220	-	
Reverse Transfer Capacitance	C _{rss}		-	6	-	
Total Gate Charge	Q _g	VDS=50V , VGS=10V , ID=50A	-	46	-	nC
Gate-Source Charge	Q _{gs}		-	12.5	-	
Gate-Drain Charge	Q _{gd}		-	15.5	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	VGS = 10V, VDS =50V, ID=50A RG = 4.7Ω	-	28	-	nS
Rise Time	t _r		-	47	-	
Turn-Off Delay Time	t _{d(off)}		-	57	-	
Fall Time	t _f		-	40	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S =1A , VGS=0V , T _J =25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	18	A
Reverse Recovery Time	T _{rr}	I _S =16A, di/dt=100A/us, T _J =25℃	-	445	-	nS
Reverse Recovery Charge	Q _{rr}		-	4661	-	nC

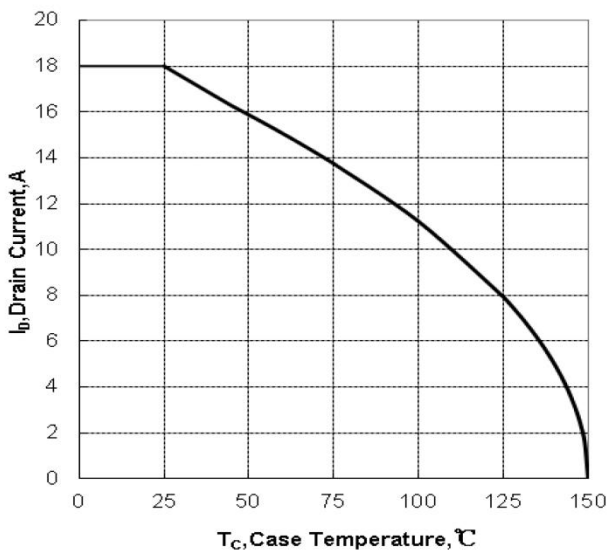
Note:

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

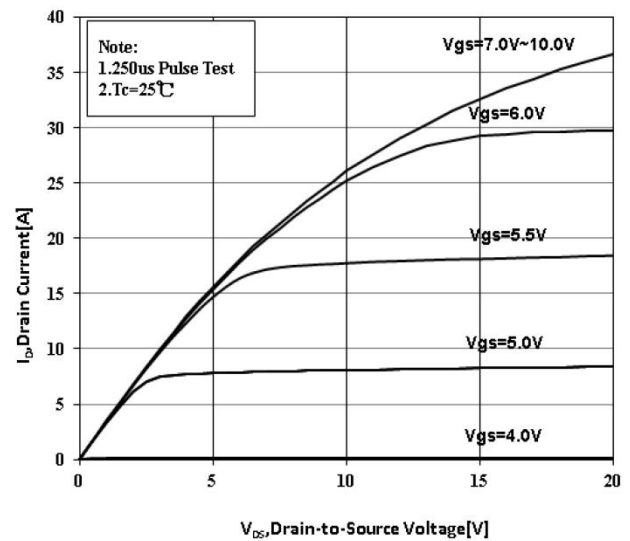
Typical Characteristics



Maximum Forward Bias Safe Operating Area

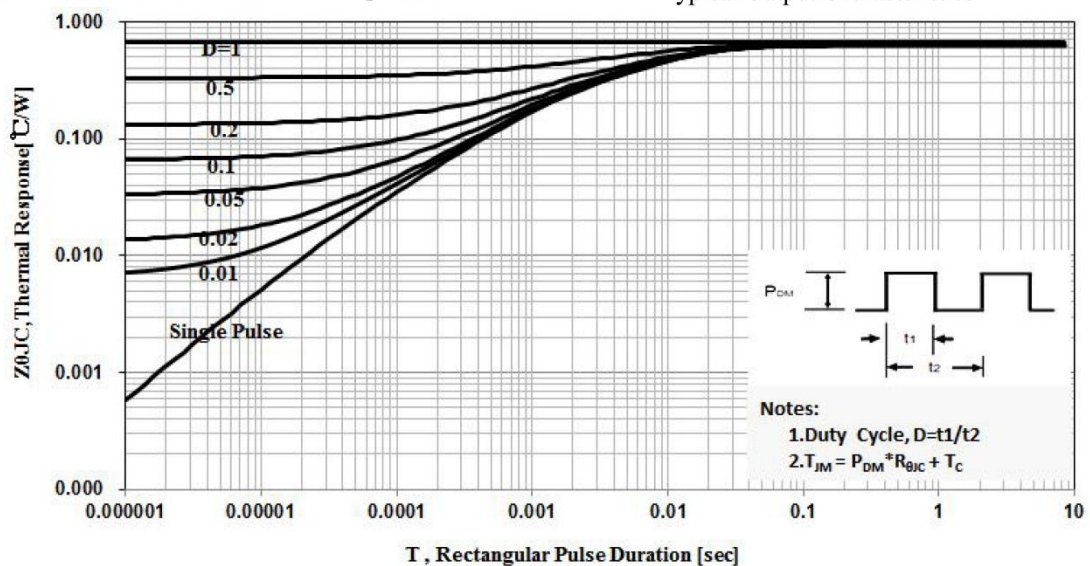


Maximum Power dissipation vs Case Temperature

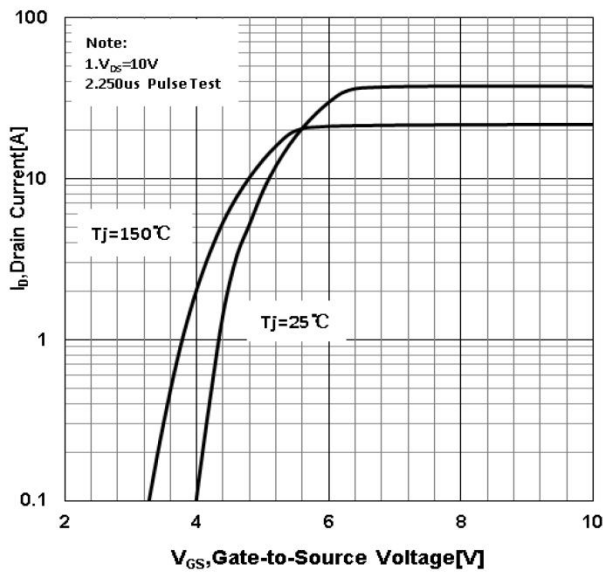


Maximum Continuous Drain Current vs Case Temperature

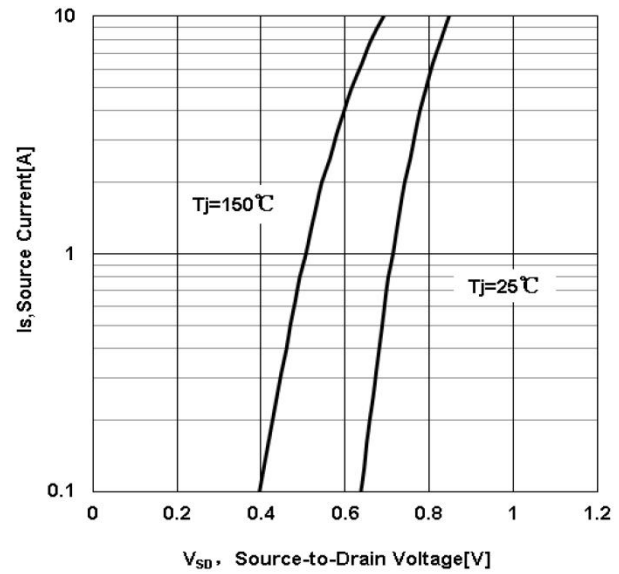
Typical Output Characteristics



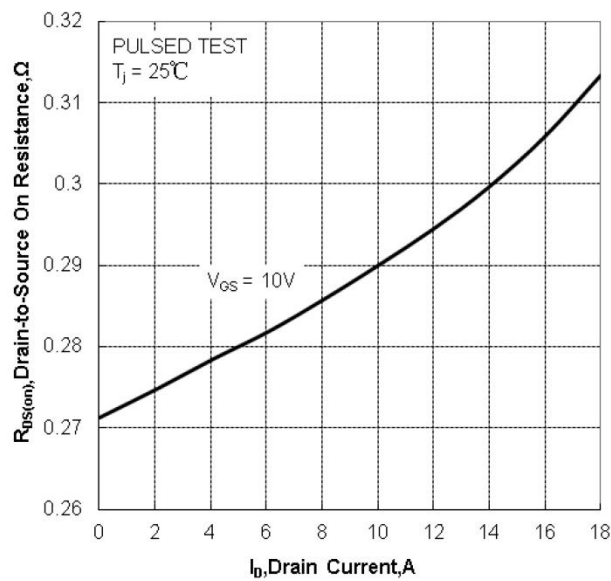
Maximum Effective Thermal Impedance, Junction to Case



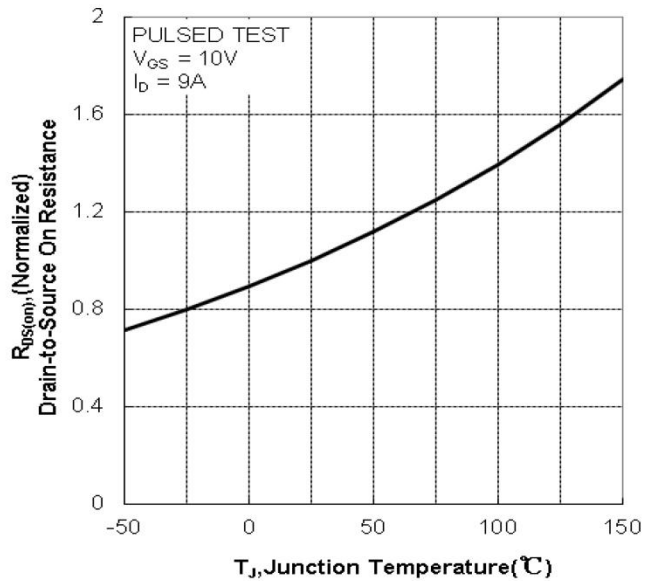
Typical Transfer Characteristics



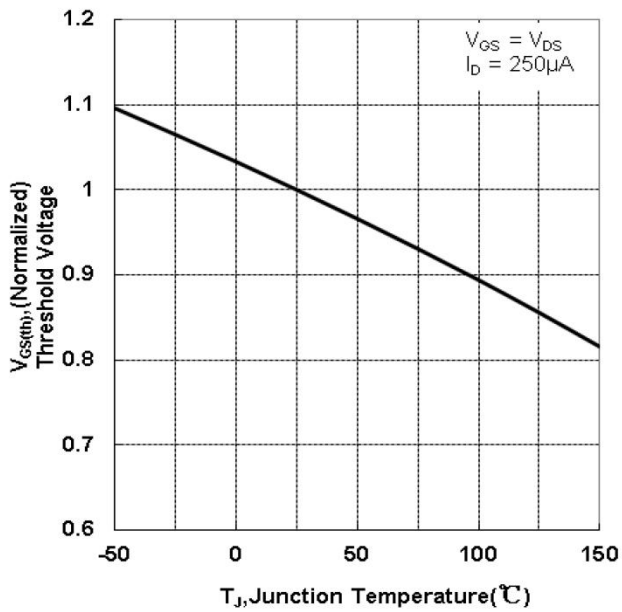
Typical Body Diode Transfer Characteristics



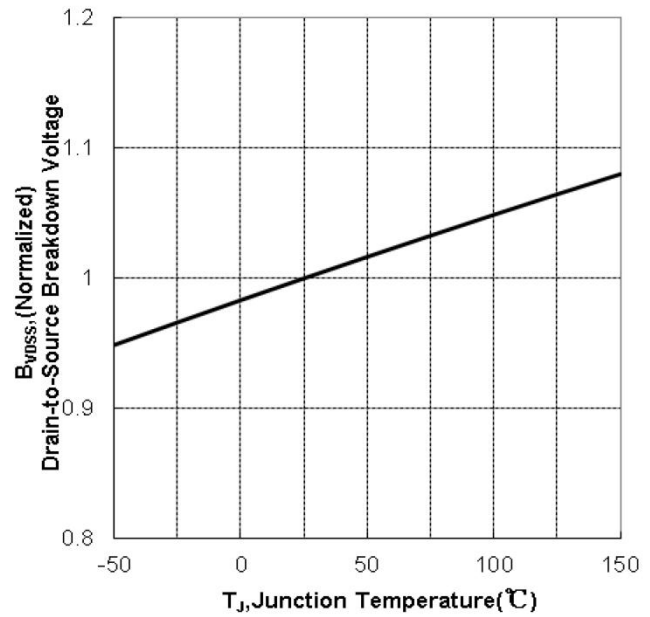
Typical Drain to Source ON Resistance
vs Drain Current



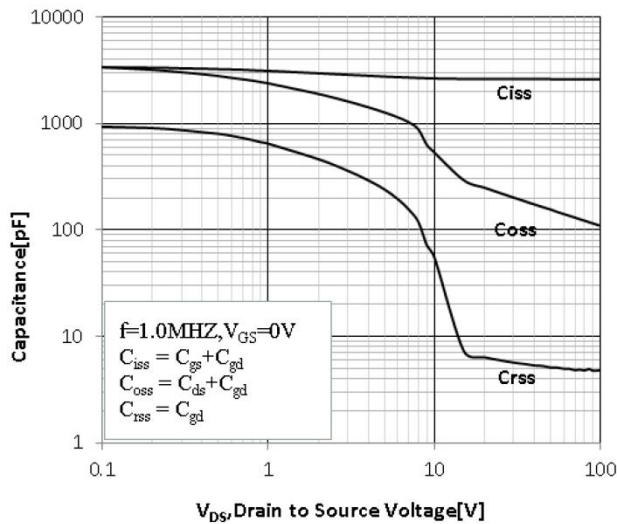
Typical Drain to Source on Resistance
vs Junction Temperature



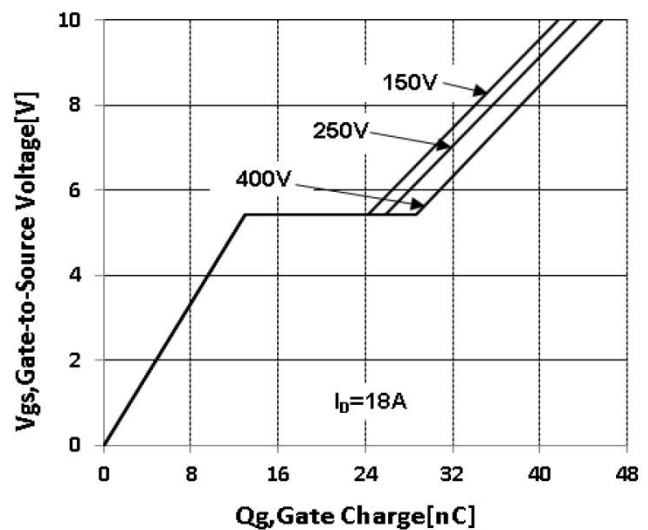
Typical Theshold Voltage vs Junction Temperature



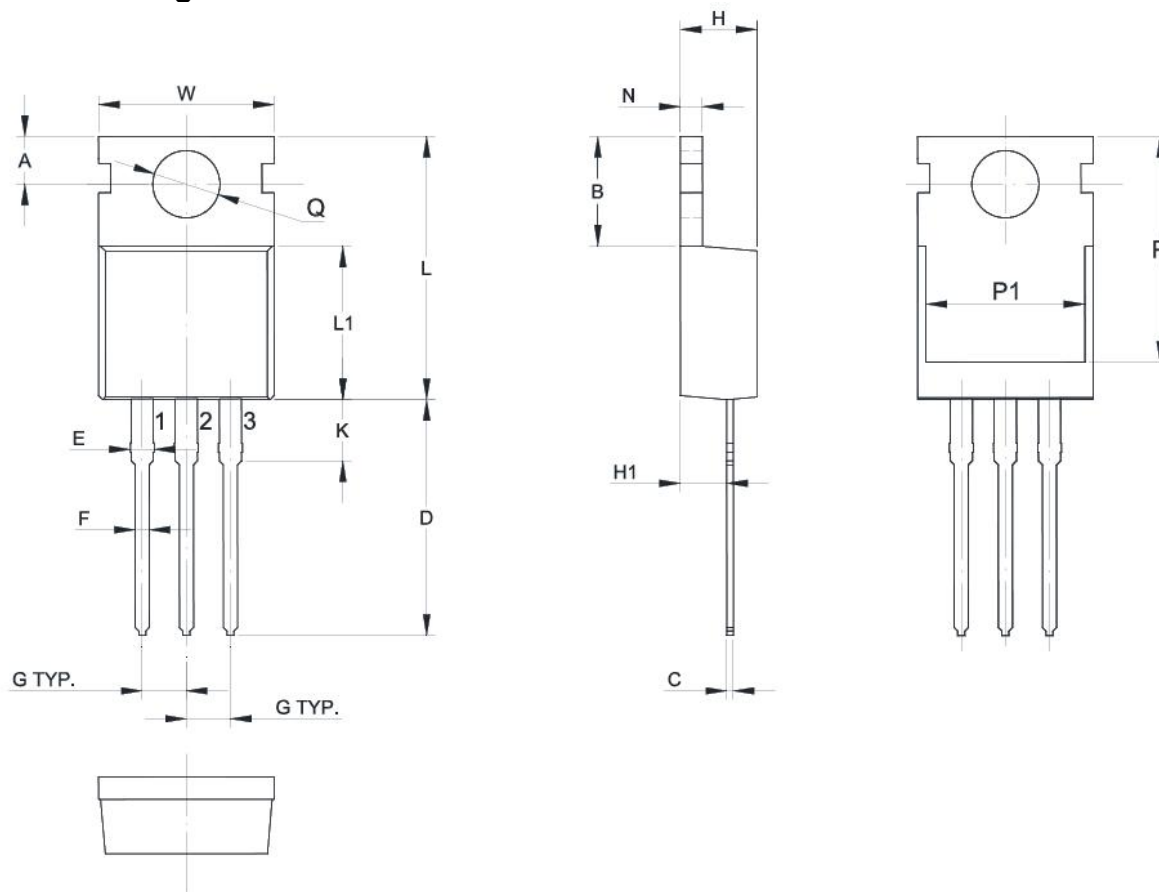
Typical Breakdown Voltage vs Junction Temperature



Typical Capacitance vs Drain to Source Voltage



Typical Gate Charge vs Gate to Source Voltage

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