

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
650V	85mΩ@10V	30A



合肥矽普半导体
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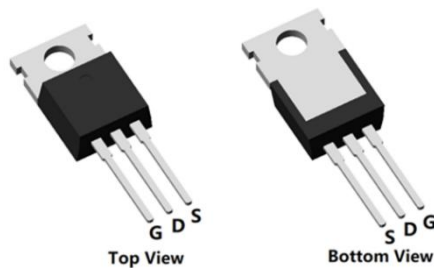
Feature

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

Applications

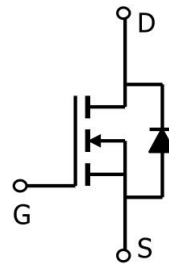
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

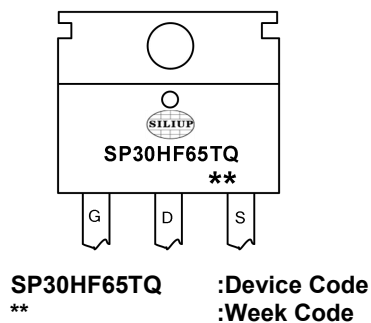


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP30HF65TQ	TO-220-3L	50

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

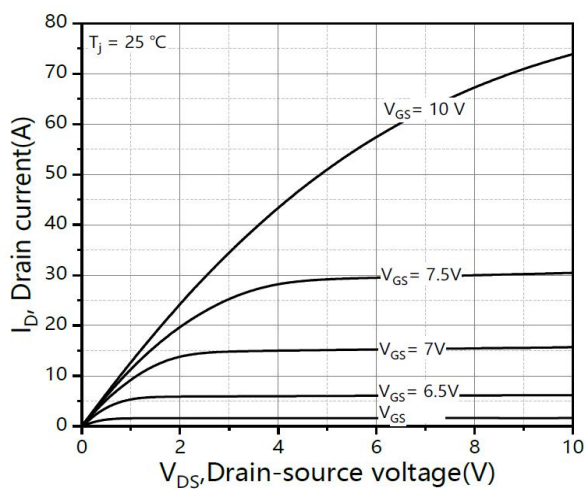
Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current (Tc=25°C)	I_D	30	A
Continuous Drain Current (Tc=100°C)	I_D	20	A
Pulsed Drain Current	I_{DM}	120	A
Single Pulse Avalanche Energy ¹	E_{AS}	362	mJ
Power Dissipation (Tc=25°C)	P_D	128	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.0	°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)

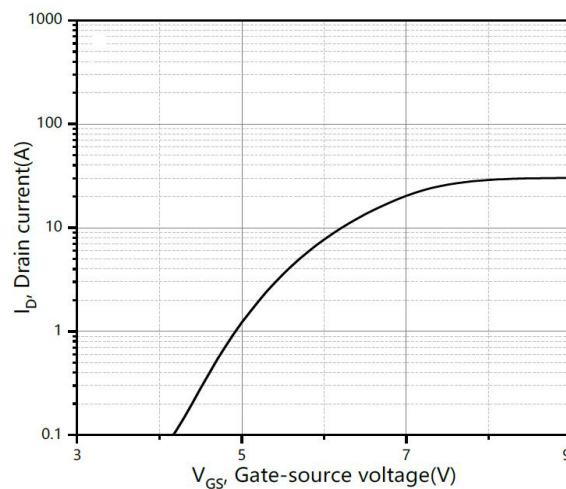
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS = 0V, ID = 250μA	650	-	-	V
Drain-Source Leakage Current	IDSS	VDS =520V, VGS = 0V	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS = ±30V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS = 10V, ID = 30A	-	85	100	mΩ
Dynamic characteristics						
Input Capacitance	Ciss	VDS=50V , VGS=0V , f=100kHz	-	2618	-	pF
Output Capacitance	Coss		-	136	-	
Reverse Transfer Capacitance	Crss		-	4.1	-	
Switching Characteristics						
Total Gate Charge	Qg	VDS=400V , VGS=10V , ID=40A	-	54	-	nC
Gate-Source Charge	Qgs		-	19	-	
Gate-Drain Charge	Qgd		-	21	-	
Turn-On Delay Time	Td(on)	VGS = 10V, VDS = 400V, ID=40A , RG = 2Ω	-	35	-	nS
Rise Time	Tr		-	152	-	
Turn-Off Delay Time	Td(off)		-	63	-	
Fall Time	Tf		-	48	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	30	A
Reverse Recovery Time	trr	IS=40A, di/dt=100A/us, TJ=25℃	-	148	-	nS
Reverse Recovery Charge	Qrr		-	1.2	-	uC

1. The test condition is $V_{DD} = 150V, V_{GS} = 10V, L = 60mH, R_G = 25\Omega$

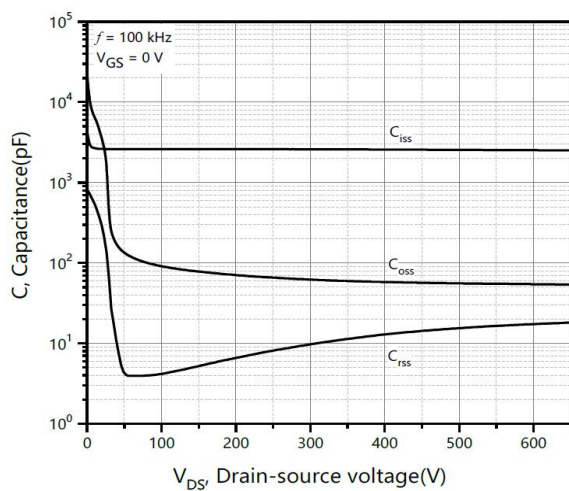
Typical Characteristics



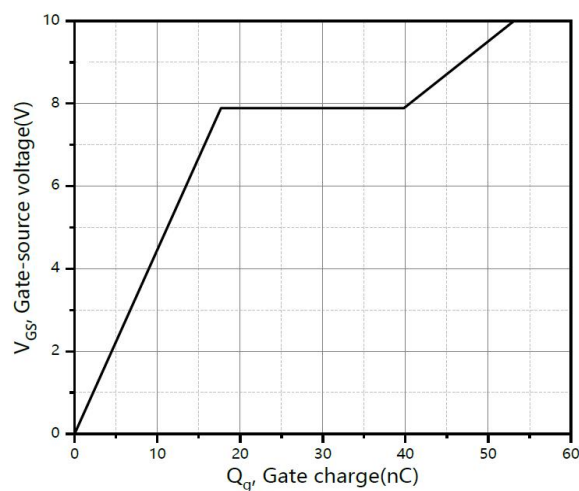
Typ. output characteristics $T_J=25^\circ\text{C}$



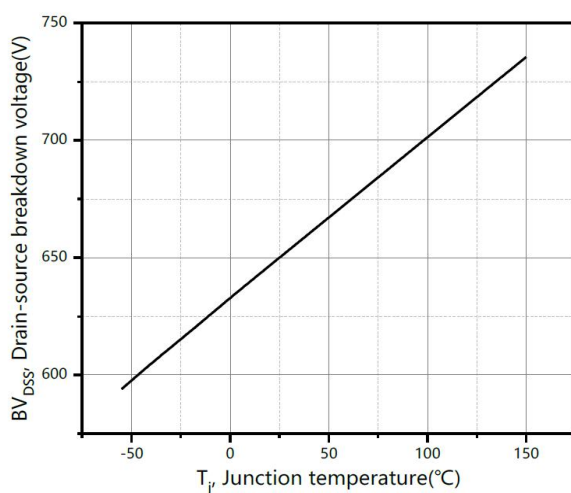
Typ. transfer characteristics



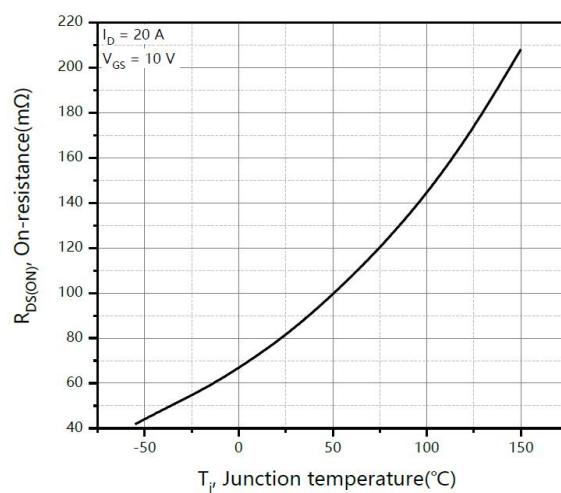
Typ. capacitances



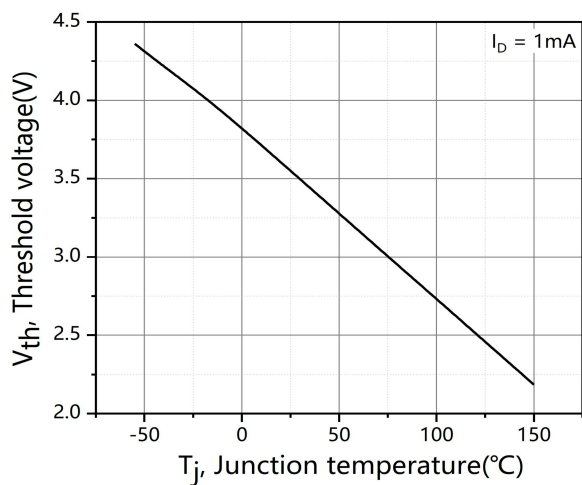
Typ. gate charge



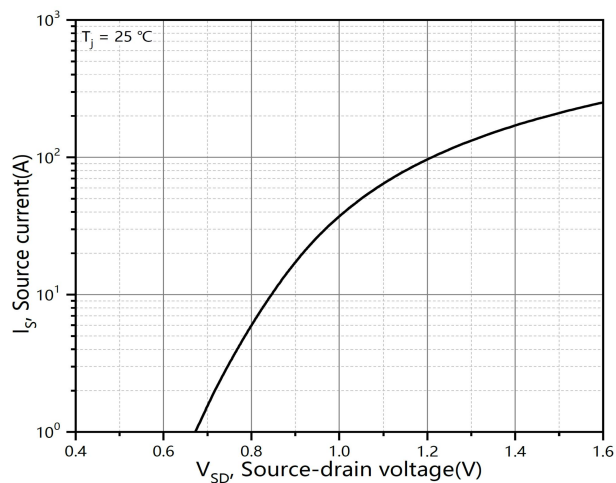
Drain-source breakdown voltage



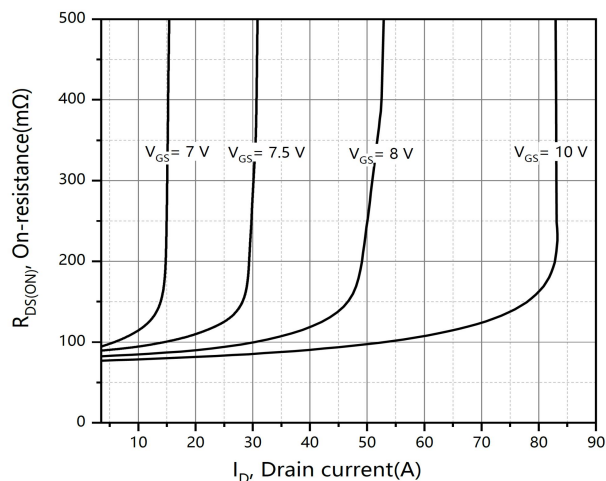
Drain-source on-state resistance



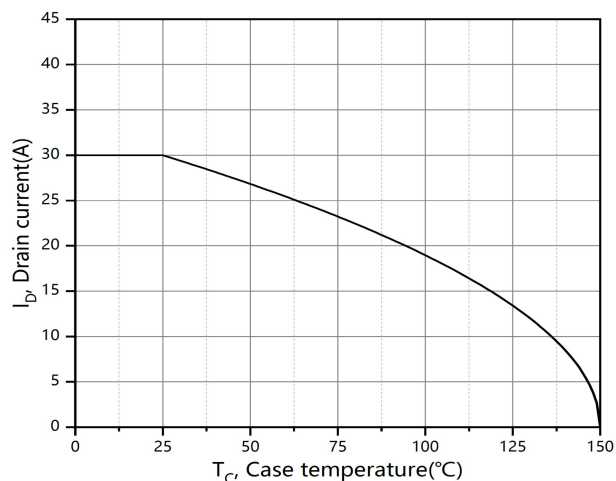
Threshold voltage



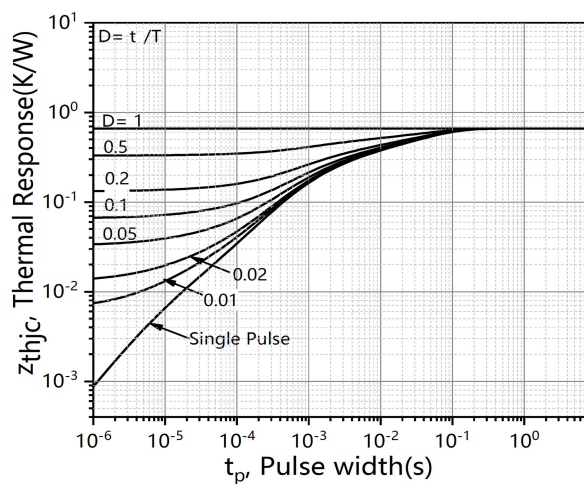
Forward characteristic of body diode



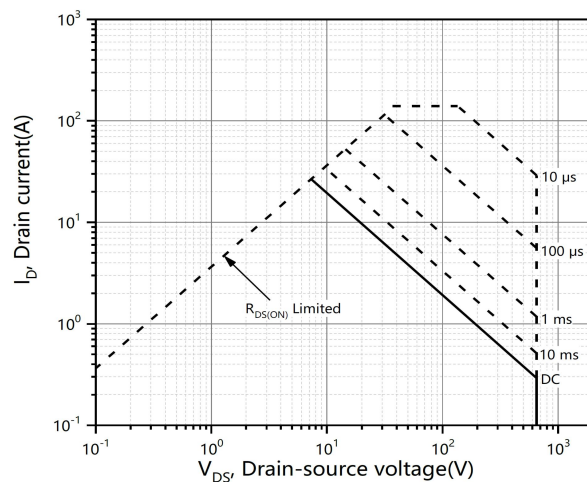
Drain-source on-state resistance



Drain current

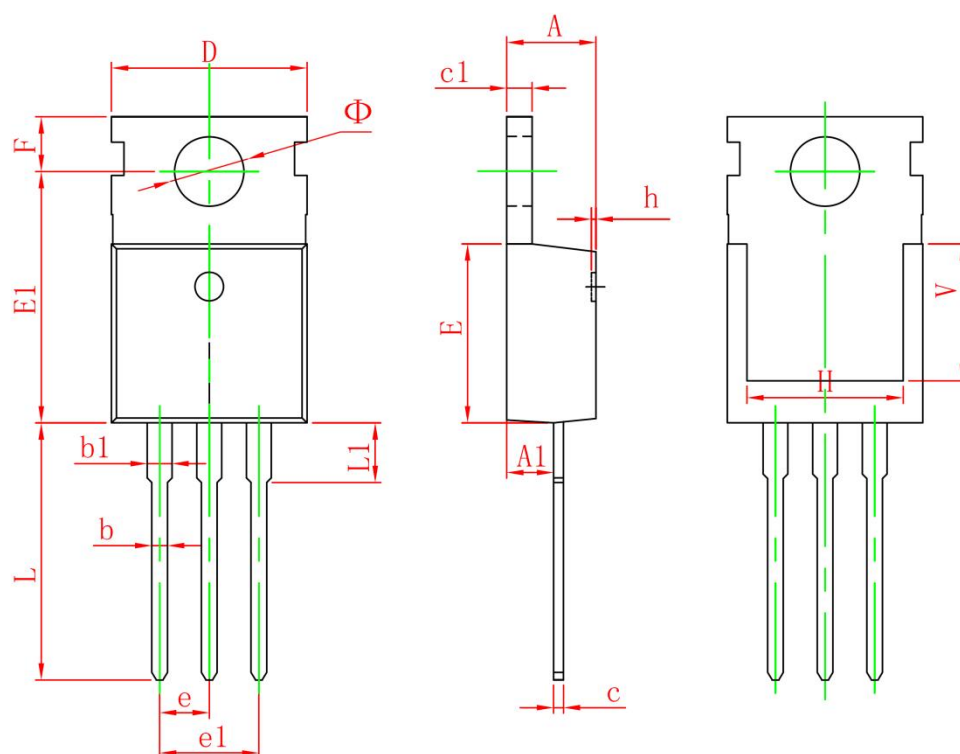


Max. transient thermal impedance



Safe operation area $T_c=25\text{°C}$

TO-220-3L-C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150