Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
300V	13mΩ@10V	135A

合肥矽普半导体
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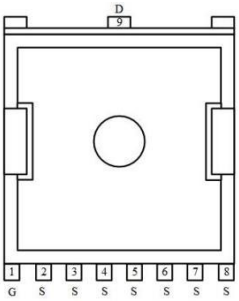
Feature

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

Applications

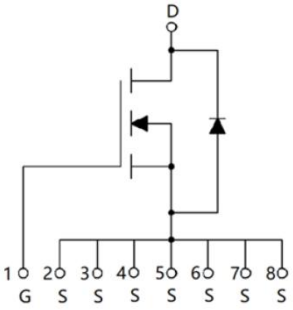
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

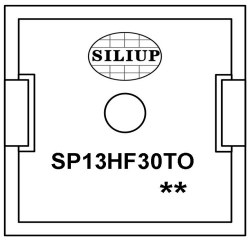


TOLL

Circuit diagram



Marking



SP13HF30TO : Product code
** : Week code

Order Information

Device	Package	Unit/Tape
SP13HF30TO	TOLL	2000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	300	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)	I_D	135	A
Continuous Drain Current (Tc=100℃)	I_D	90	A
Pulsed Drain Current	I_{DM}	410	A
Single Pulse Avalanche Energy[1]	E_{AS}	1332	mJ
Power Dissipation (Tc=25℃)	P_D	500	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.25	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

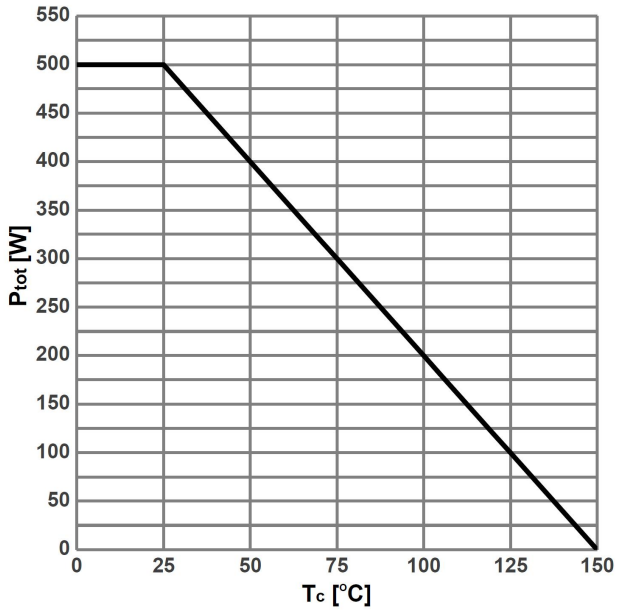
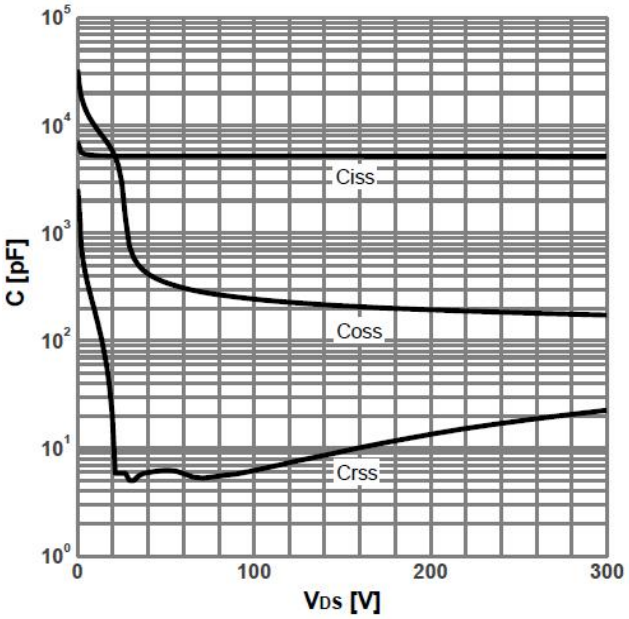
Electrical characteristics (Ta=25℃, unless otherwise noted)

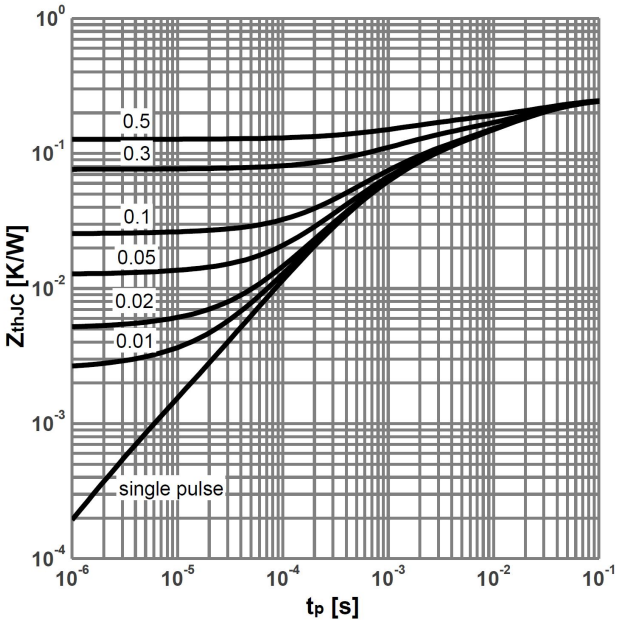
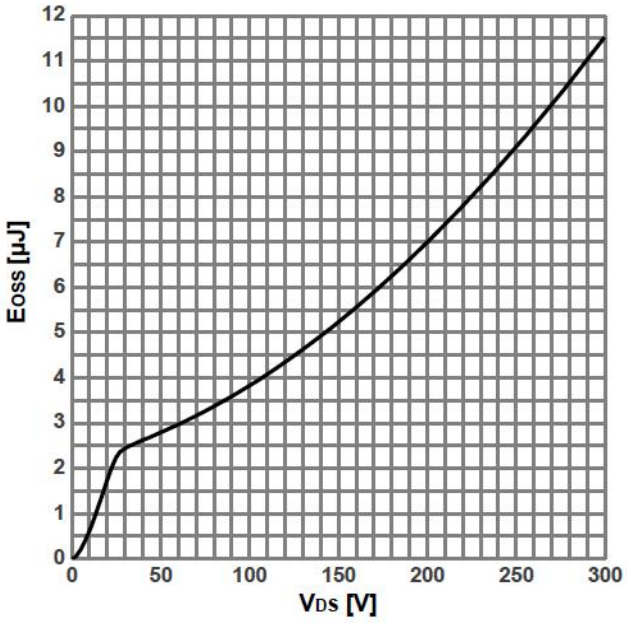
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS = 0V,ID = 250μA	300	350	-	V
Drain-Source Leakage Current	I_{DSS}	VDS =240V, VGS = 0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	VGS = ±20V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VDS = VGS, ID = 250μA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS = 10V, ID = 35A	-	13	16	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=50V , VGS=0V , f=1MHz	-	5200	-	pF
Output Capacitance	C_{oss}		-	340	-	
Reverse Transfer Capacitance	C_{rss}		-	6.5	-	
Switching Characteristics						
Total Gate Charge	Q_g	VDS=200V , VGS=10V , ID=40A	-	85	-	nC
Gate-Source Charge	Q_{gs}		-	26	-	
Gate-Drain Charge	Q_{gd}		-	22	-	
Turn-On Delay Time	$T_{d(on)}$	VGS = 10V, VDS = 200V, ID=40A , RG = 20Ω	-	49	-	nS
Rise Time	T_r		-	32	-	
Turn-Off Delay Time	$T_{d(off)}$		-	82	-	
Fall Time	T_f		-	8	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	135	A
Reverse Recovery Time	t_{rr}	IS=40A,di/dt=100A/us, Tj=25℃	-	118	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.56	-	uC

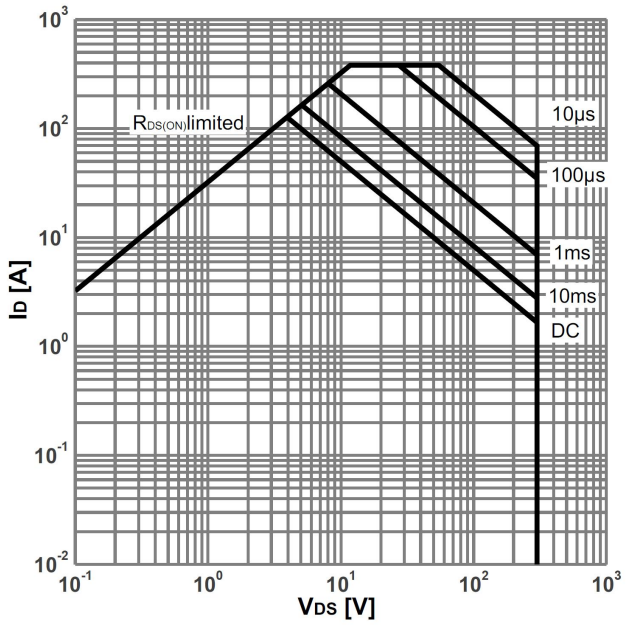
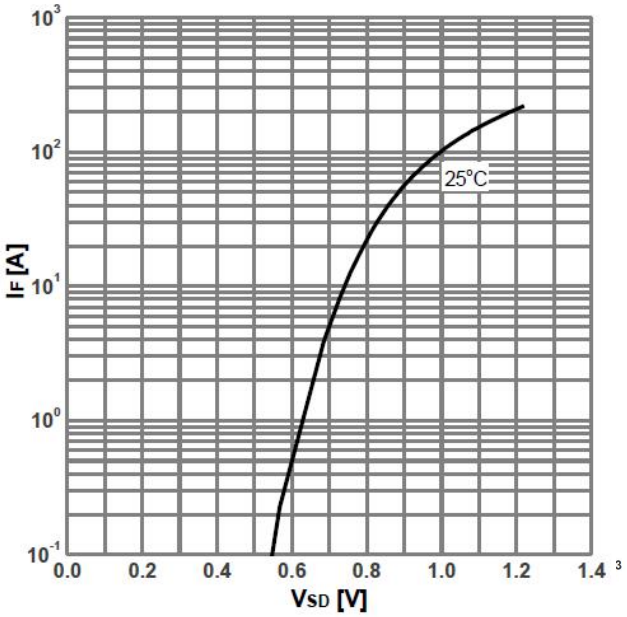
Note :

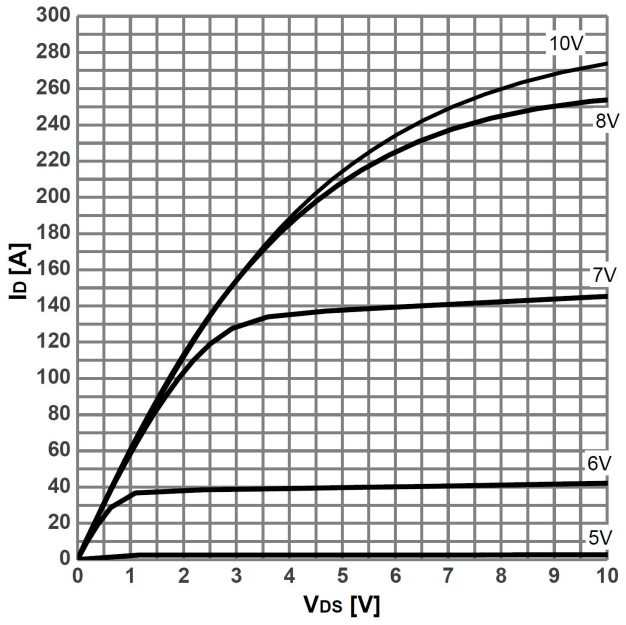
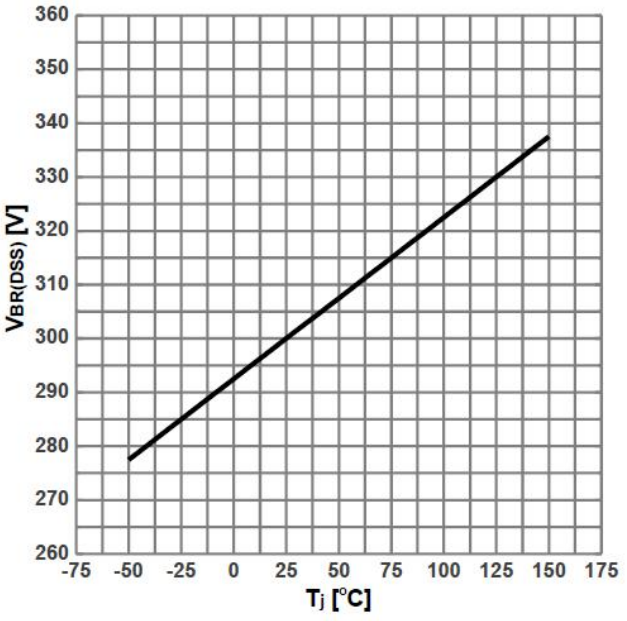
1. The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

Typical Characteristics

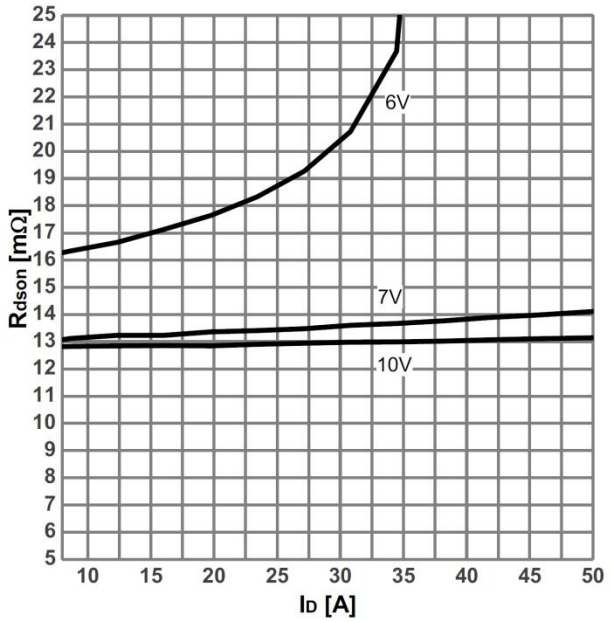
Power dissipation	Typ. capacitances
	
P_{tot}=f(T_C)	*C=f(VDS); VGS=0V; f=1MHz*

Max. transient thermal impedance	Typ. Coss stored energy
	
Z_{thJC}=f(t_p); parameter: D= t_p/T	*EOSS =f(VDS)*

Safe operating area	Forward characteristics of reverse diode
	
I_D=f(V_{DS}); T_j=25°C; D=0; parameter: t_p	*IF=f(VSD); parameter: Tj*

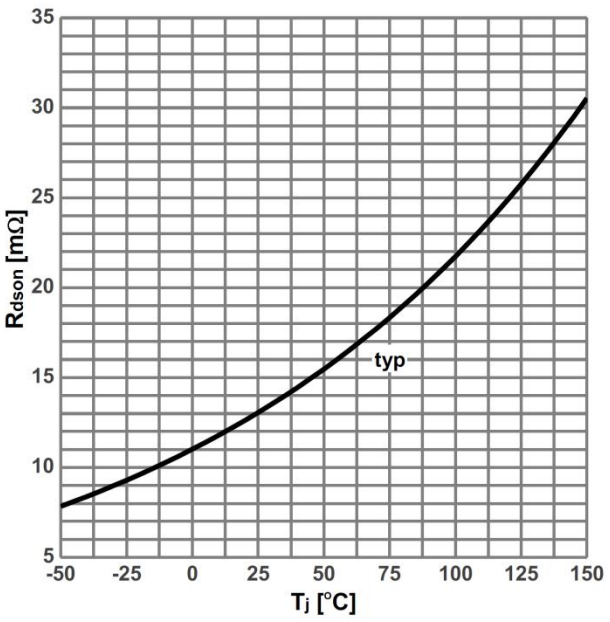
Typ. output characteristics	Drain-source breakdown voltage
	
I_D=f(V_{DS}); T_j=25°C; parameter: V_{GS}	*VBR(DSS)=f(Tj); ID=1mA*

Typ. drain-source on-state resistance



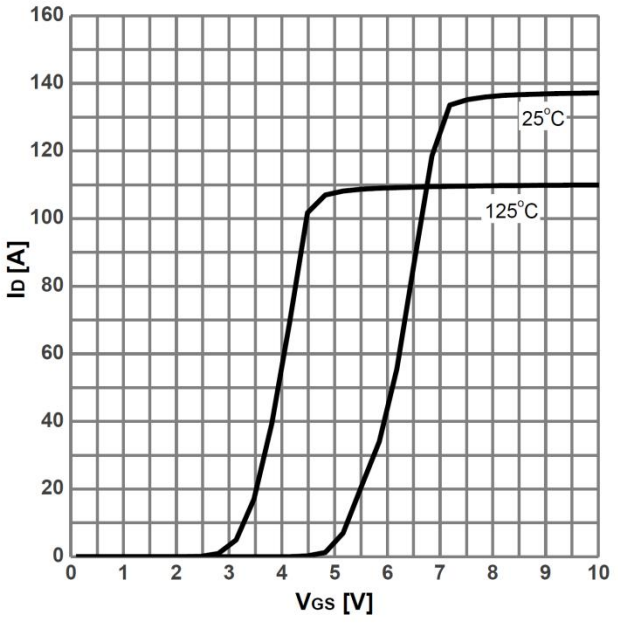
$R_{DS}(on)=f(I_D)$; $T_j=25°C$; parameter: V_{GS}

Drain-source on-state resistance



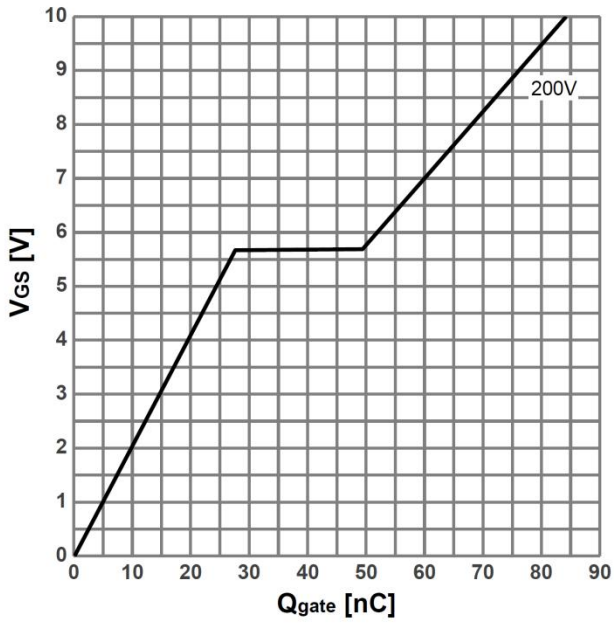
$R_{DS}(on)=f(T_j)$; $I_D=36A$; $V_{GS}=10V$

Typ. transfer characteristics



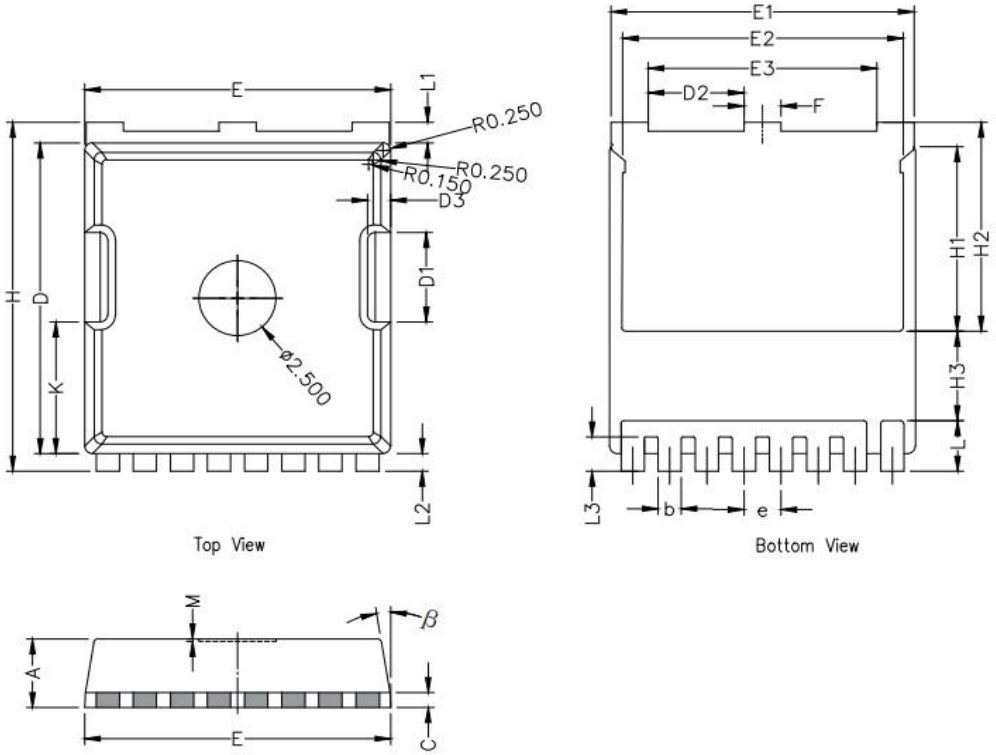
$I_D=f(V_{GS})$; $V_{DS}=20V$; parameter: T_j

Typ. gate charge



$V_{GS}=f(Q_{gate})$; $I_D=40A$ pulsed; $V_{DS}=200V$

TOLL Package Information



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
C		0.508 REF	
D	10.25	10.40	10.55
D1	2.85	3.00	3.15
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.95	9.10	9.25
E3	7.25	7.40	7.55
e		1.20 BSC	
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.18	6.33
H2	6.85	7.00	7.15
H3		3.00 BSC	
L	1.55	1.70	1.85
L1	0.55	0.7	0.85
L2	0.45	0.6	0.75
M		0.08 REF.	
β	8°	10°	12°
K	4.25	4.40	4.55