SP47MF65TF

650V Super-Junction MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
650V	65mΩ@10V	47A

合肥矽普半导体
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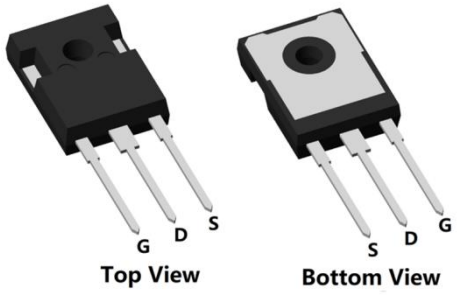
Feature

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

Applications

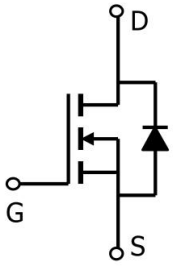
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

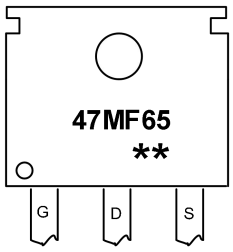


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



47MF65 :Device Code
**** :Week Code

Order Information

Device	Package	Unit/Tube
SP47MF65TF	TO-247	30

Absolute maximum ratings (Ta=25℃,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℃)	I_D	47	A
Continuous Drain Current (Tc=100℃)	I_D	29	A
Pulsed Drain Current	I_{DM}	188	A
Single Pulse Avalanche Energy[1]	E_{AS}	1160	mJ
Power Dissipation (Tc=25℃)	P_D	391	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.32	℃/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)

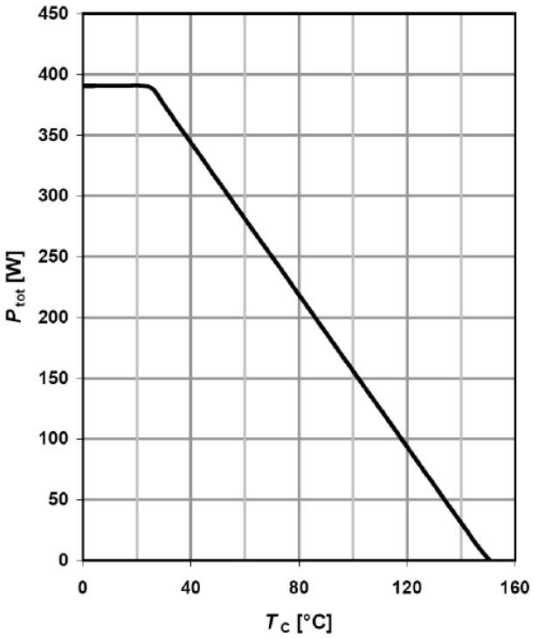
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250μA, V_{GS} = 0V	650	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS} = 520V, V_{GS} = 0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V	-	-	±0.1	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	3	4	5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 23A	-	65	75	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=25V , VGS=0V , f=1MHz	-	3080	-	pF
Output Capacitance	C_{oss}		-	140	-	
Reverse Transfer Capacitance	C_{rss}		-	7	-	
Total Gate Charge	Q_g	VDS=480V , VGS=10V , ID=23A	-	194	-	nC
Gate-Source Charge	Q_{gs}		-	35	-	
Gate-Drain Charge	Q_{gd}		-	90	-	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDD=480V, VGS=10V , RG=2Ω, ID=10A	-	22	-	nS
Rise Time	T_r		-	10	-	
Turn-Off Delay Time	$T_{d(off)}$		-	90	-	
Fall Time	T_f		-	5	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	47	A
Reverse recover time	T_{rr}	I_S=23A, di/dt=100A/us, Tj=25℃	-	210	-	nS
Reverse recovery charge	Q_{rr}		-	1.2	-	uC

Note :

1. The test condition is VDD=100V,VGS=10V,L=60mH,RG=25Ω

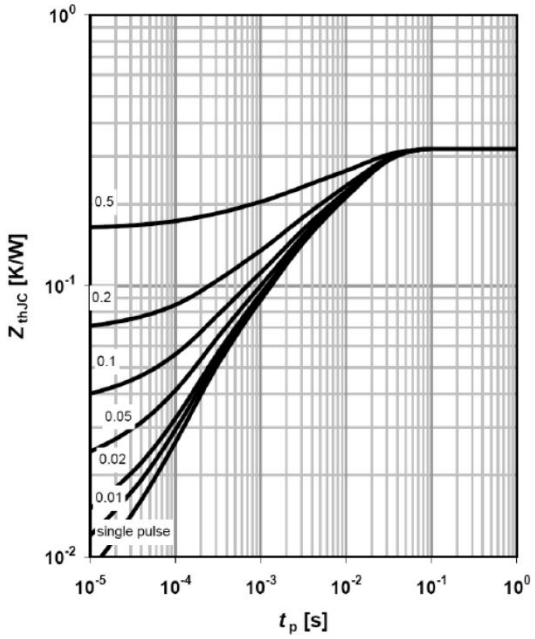
Typical Characteristics

Power dissipation



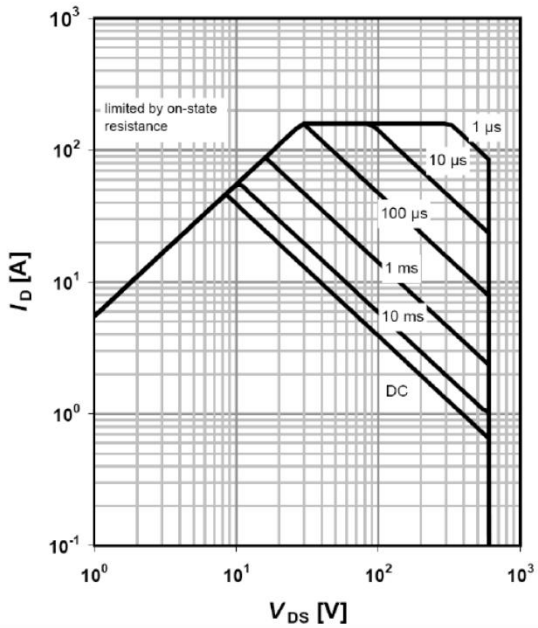
$P_{tot} = f(T_C)$

Max. transient thermal impedance



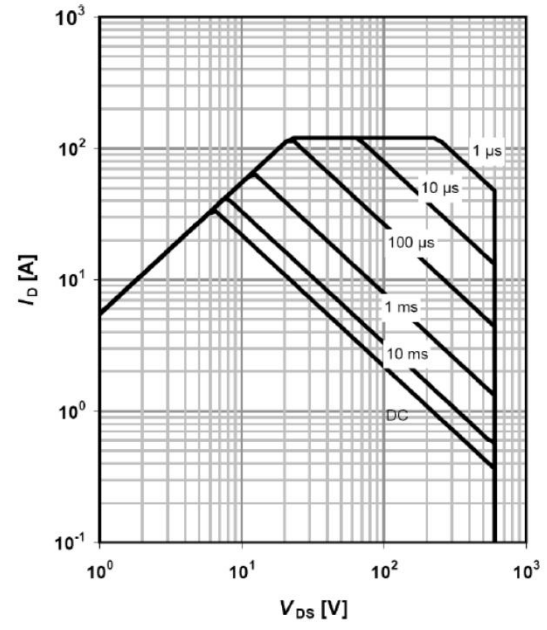
$Z_{(thJC)}$=f(tp); parameter: D=t_p/T

Safe operating area T_C=25 °C



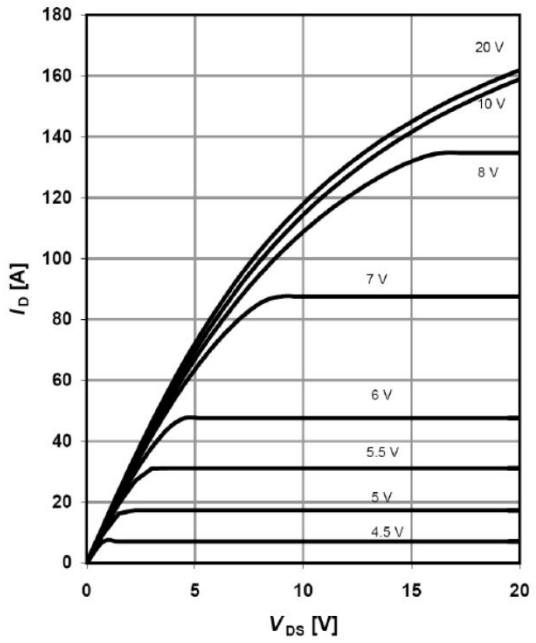
I_D=f(V_{DS}); T_C=25 °C; V_{GS} > 7V; D=0; parameter t_p

Safe operating area T_C=80 °C



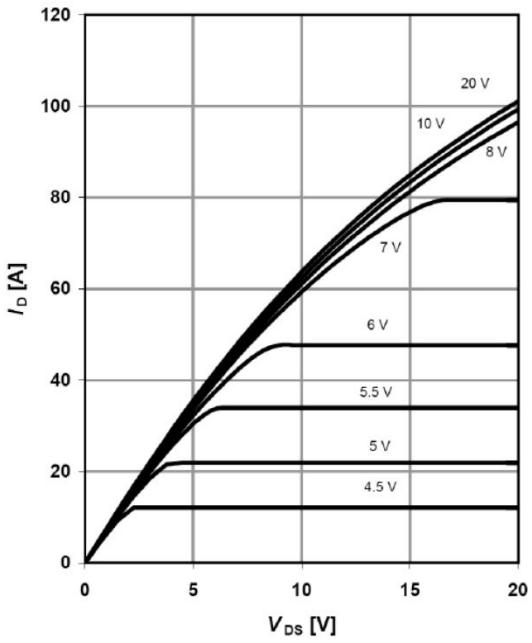
I_D=f(V_{DS}); T_C=80°C; V_{GS} > 7V; D=0; parameter t_p

Typ. output characteristics T_j=25 °C



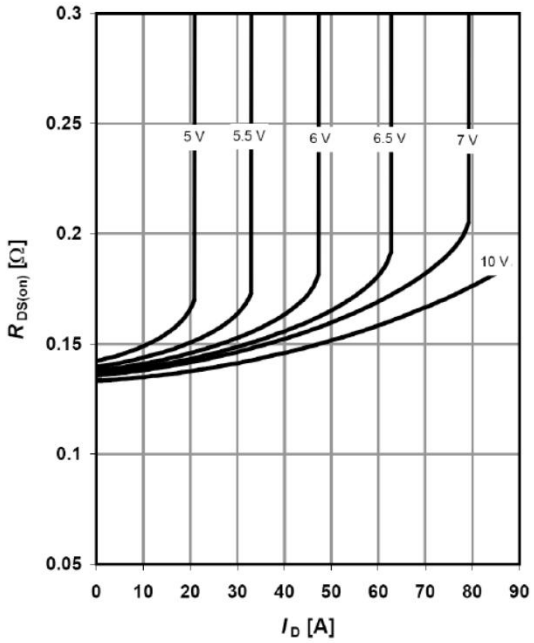
I_D=f(V_{DS}); T_j=25 °C; parameter: V_{GS}

Typ. output characteristics T_j=125 °C



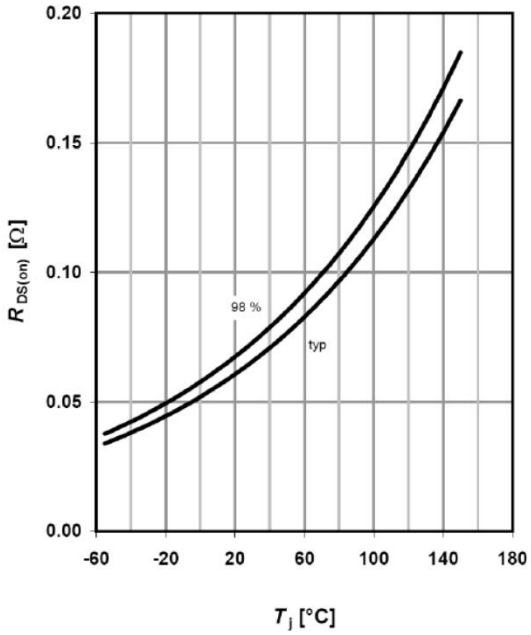
I_D=f(V_{DS}); T_j=125 °C; parameter: V_{GS}

Typ. drain-source on-state resistance



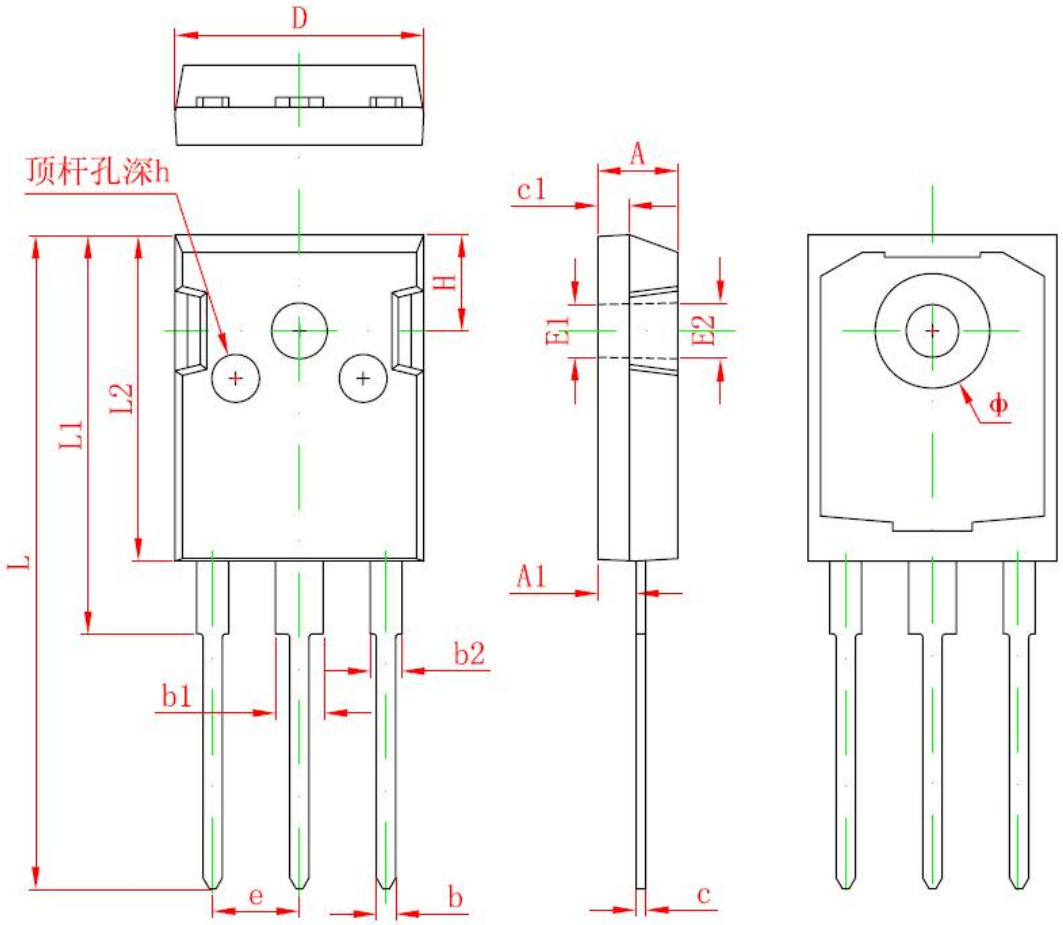
$R_{DS(on)}$=f(I_D); T_j=125 °C; parameter: V_{GS}

Drain-source on-state resistance



$R_{DS(on)}$=f(T_j); I_D=17.6 A; V_{GS}=10 V

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