RTK10N50C

RTK10N50C – 500V 10A N-channel Si Power MOSFET

PowerCubeSemi, Inc.
Potential · Convergence · Smart

Features

- Proprietary New Planar Technology
- $R_{DS(ON)}$ (Typ)= 0.45Ω @ V_{GS}=10V
- 100% UIS Tested

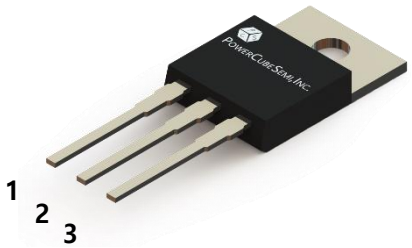
Applications

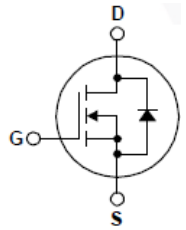
- Power Factor Correction, PFC
- Switched Mode Power Supplies
- LED Driver

Part Number	Package	Note
RTK10N50C	TO-220	

Pin Description

1 : Gate
2 : Drain
3 : Source





Halogen-Free

RoHS

PKG type : TO-220

Absolute Maximum Ratings T_C=25℃ Unless Otherwise Noted

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to Source Voltage		500	V
V_{GSS}	Gate to Source Voltage		±30	
I_D	Continuous Drain Current (V_{GS}=10V)	T_C=25℃	10	A
I_{DM}	Pulsed Drain Current	T_C=25℃	40	A
P_D	Power dissipation	T_C=25℃	150	W
E_{AS}	Avalanche Energy, Single Pulsed		700	mJ
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃

Static Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	500	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 500V, V_{GS} = 0V	-	-	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS}, I_D = 250μA	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	V_{GS} = 10V, I_D = 5A	-	0.45	0.75	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
C_{iss}	Input capacitance	V_{DS}=25V, V_{GS}=0V, f=1㎒	-	1650	-	pF
C_{oss}	Output capacitance		-	148	-	
C_{rss}	Reverse transfer capacitance		-	7	-	
$t_{d(on)}$	Turn-on Delay time	V_{DS}=250V, I_D=10A, V_{GS}=10V, R_G=25Ω	-	50	-	ns
T_r	Turn-on Rise time		-	23	-	
$t_{d(off)}$	Turn-off Delay time		-	54	-	
T_f	Turn-off Fall time		-	25	-	

Gate Charge Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$Q_{g(tot)}$	Total gate charge at 10V	V_{DS}=400V, I_D=10A, $V_{GS(on)}$=10V	-	32	-	nC
Q_{gs}	Gate to source gate charge		-	9	-	
Q_{gd}	Gate to drain "Miller" charge		-	10	-	

Diode Characteristics

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_{SD}	Continuous Source Current		-	10	A
I_{SM}	Pulsed Source Current		-	40	
V_{SD}	Drain to source diode forward voltage	I_{SD}=10A, V_{GS} = 0V	-	1.5	V
T_{rr}	Reverse recovery time	I_F=12A, V_R=325V, dI_F/dt=100A/μs	370	-	ns
Q_{rr}	Reverse recovery charge		3.4	-	μC

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.83	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	℃/W

Typical Characteristics

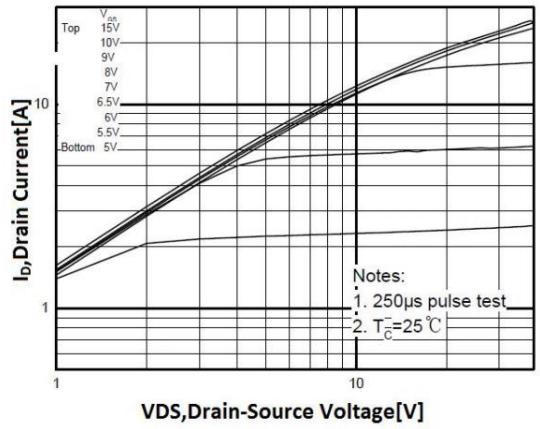


Figure 1. Output Characteristics at T_C=25℃

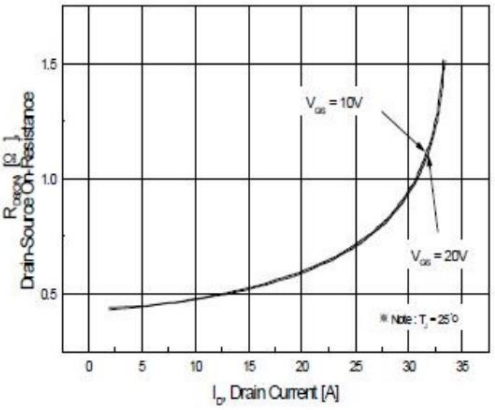


Figure 2. On-Resistance vs. Drain Current and Gate Voltage

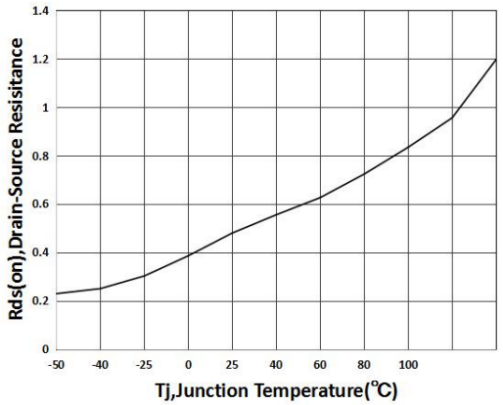


Figure 3. Normalized On-Resistance vs. Temperature

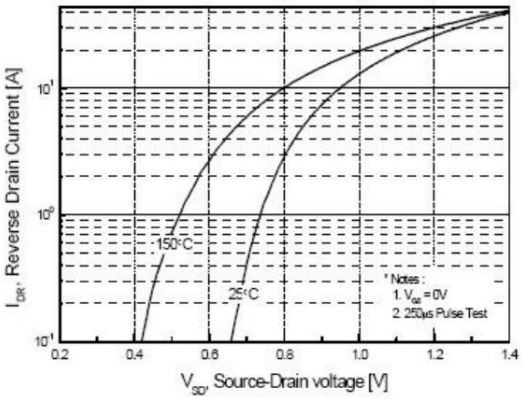


Figure 4. Typical Source to Drain Diode Forward Voltage

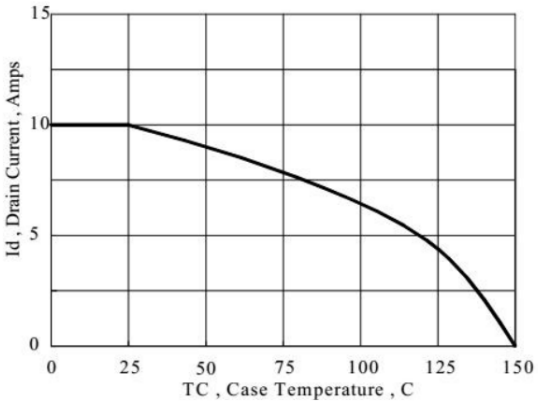


Figure 5. Maximum Drain Current vs. Case Temperature

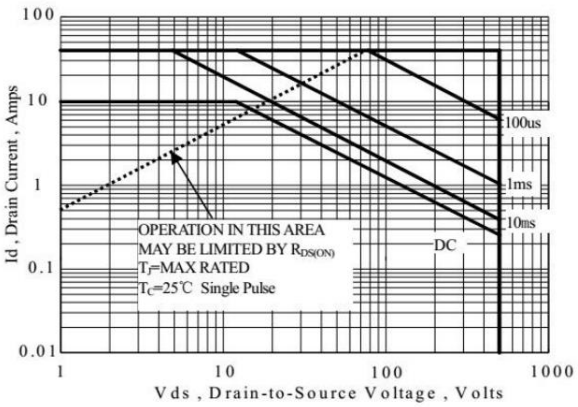
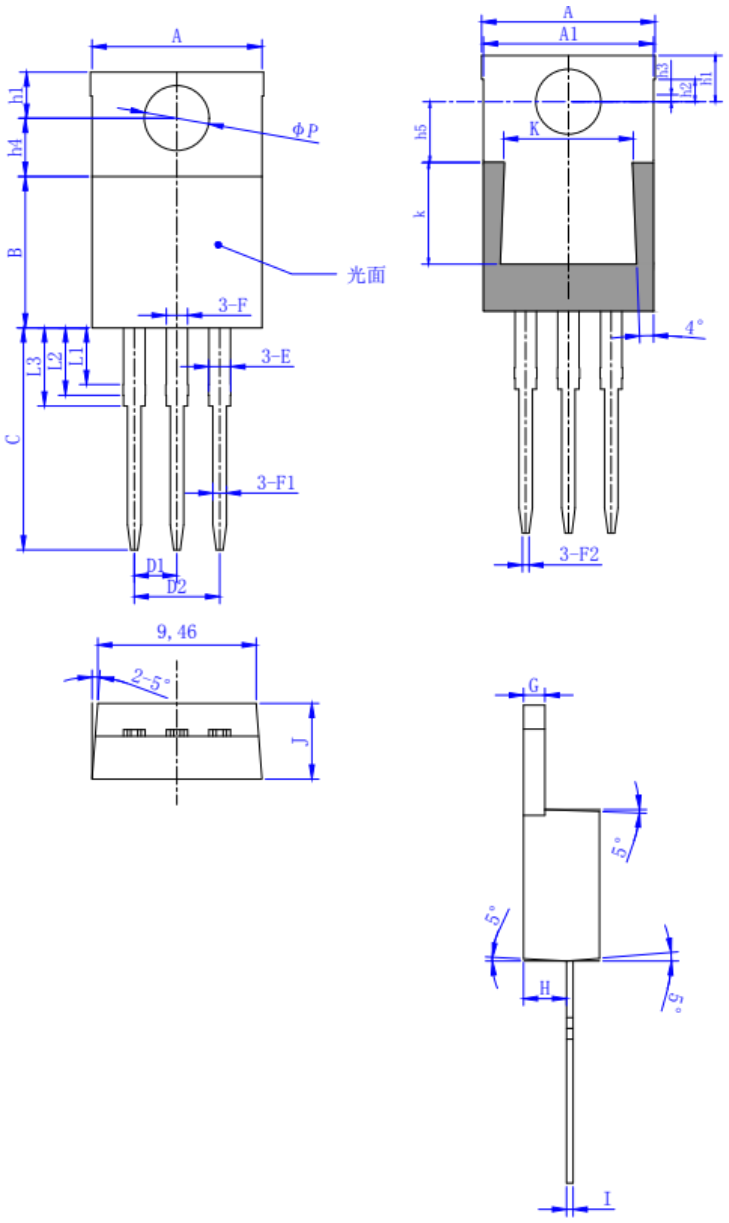


Figure 6. Maximum Safe Operating Area

Package Outline

Unit : mm



SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	10.1	10.3	10.5
A1	10.0	10.1	10.2
B	8.8	9.0	9.2
C	13.0	13.3	13.5
D1		2.54 BSC	
D2		5.08 BSC	
E	1.27	1.32	1.40
F	1.25	1.27	1.30
F1	0.75	0.80	0.85
F2	0.35	0.40	0.45
G	1.26	1.27	1.28
H	2.40	2.55	2.70
h1	2.70	2.74	2.80
h2	1.27	1.32	1.37
h3	0.40	0.42	0.45
h4	3.40	3.45	3.50
h5	3.60	3.63	3.65
I	0.35	0.38	0.45
J	4.45	4.50	4.60
K	7.60	7.70	7.80
k	6.00	6.03	6.05
L1	3.30	3.40	3.5
L2	3.90	4.00	4.10
L3	4.50	4.60	4.70
ΦP	3.75	3.80	3.90