RTK2N50D

RTK2N50D – 500V 2A N-channel Si Power MOSFET

PowerCubeSemi, Inc.
Potential · Convergence · Smart

Features

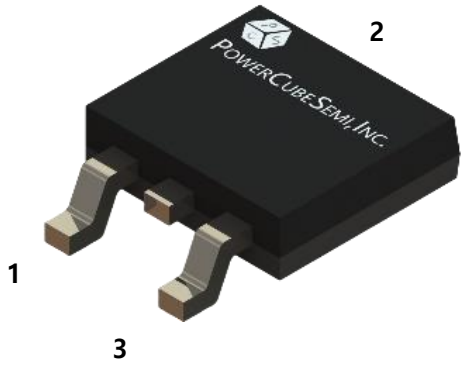
- High switching
- Excellent package for good heat dissipation
- $R_{DS(ON)}$= 8.0Ω @ V_{GS}=10V
- 100% Avalanche Tested

Applications

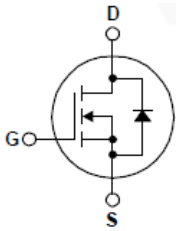
- Power switching application
- DC-DC Converters

Pin Description

1 : Gate
2 : Drain
3 : Source



PKG type : TO-252 (DPAK)



Halogen-Free

RoHS

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℃	2	A
		T_C=100℃	1.2	
I_{DM}	Pulsed Drain Current	T_C=25℃	8	A
P_D	Power dissipation	T_C=25℃	10.2	W
E_{AS}	Avalanche Energy, Single Pulsed		52	mJ
dv/dt	Peak diode recovery dv/dt		5	V/ns
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃

Static Characteristics

T_C=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	-	-	1	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	2.0	-	4.0	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	V_{GS} = 10V, I_D = 1A	-	5.2	8.0	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
C_{iss}	Input capacitance	V_{DS}=25V, V_{GS}=0V, f=1㎒	-	194	-	pF
C_{oss}	Output capacitance		-	17.3	-	
C_{rss}	Reverse transfer capacitance		-	1.1	-	
$t_{d(on)}$	Turn-on Delay time	V_{DS}=250V, I_D=2A, V_{GS}=10V, R_G=25Ω	-	3.2	-	ns
T_r	Turn-on Rise time		-	8.1	-	
$t_{d(off)}$	Turn-off Delay time		-	8.9	-	
T_f	Turn-off Fall time		-	6.3	-	

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=2A, $V_{GS(on)}$=10V	-	8.5	-	nC
Q_{gs}	Gate to source gate charge		-	2.5	-	
Q_{gd}	Gate to drain "Miller" charge		-	2.6	-	

Diode Characteristics

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	2	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		-	8	
V_{SD}	Drain to source diode forward voltage	I_{SD}=2A, V_{GS} = 0V	-	1.2	V
T_{rr}	Reverse recovery time	I_F=2A, V_R=400V, dI_F/dt=100A/μs	39.6	-	ns
Q_{rr}	Reverse recovery charge		0.4	-	nC

Typical Characteristics

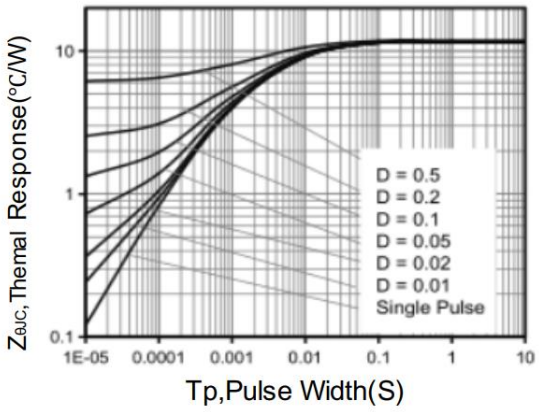


Figure 1. Transient Thermal Impedance

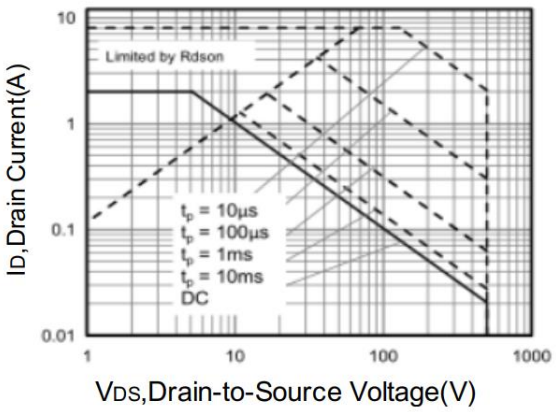


Figure 2. Safe Operation Area

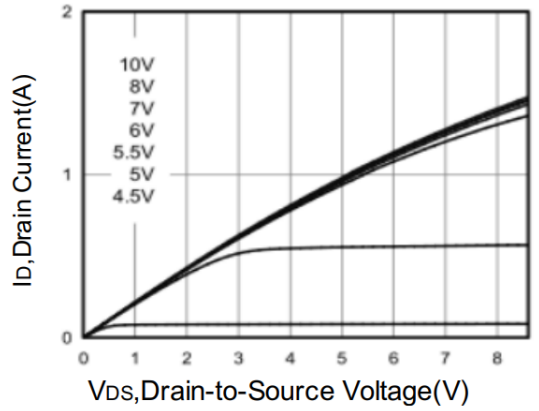


Figure 3. Output Characteristics

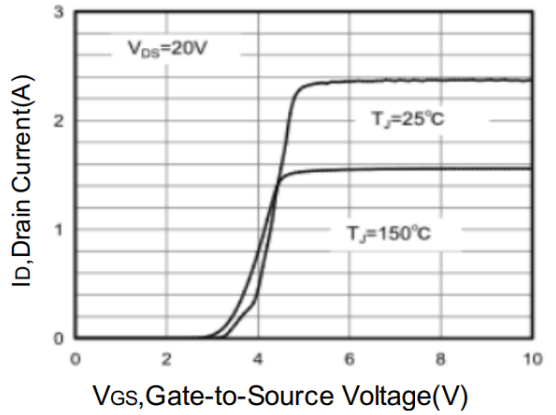


Figure 4. Transfer Characteristics

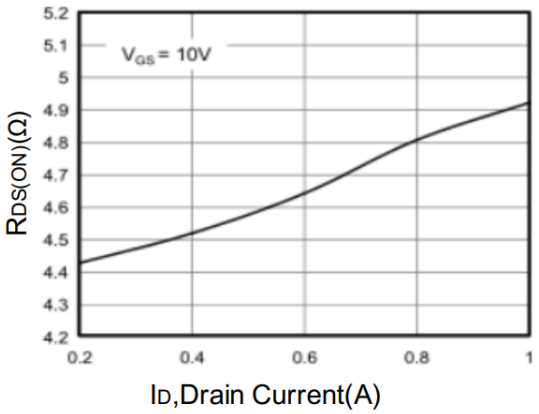


Figure 5. On-Resistance vs. Drain Current

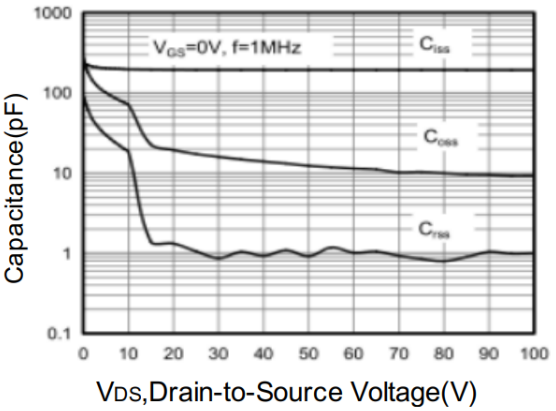


Figure 6. Capacitance Characteristics

Typical Characteristics

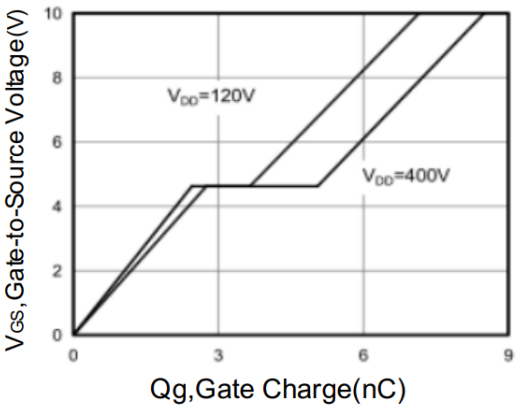


Figure 7. Gate Charge

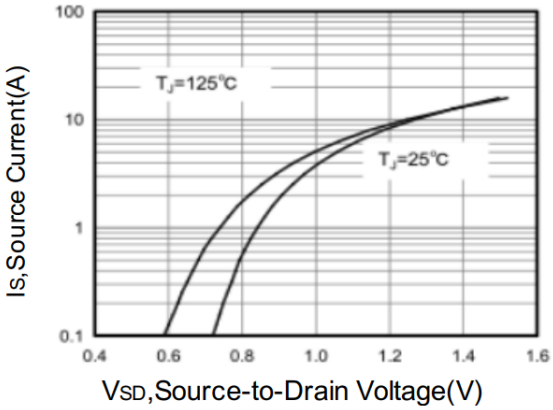


Figure 8. Body Diode Forward Voltage

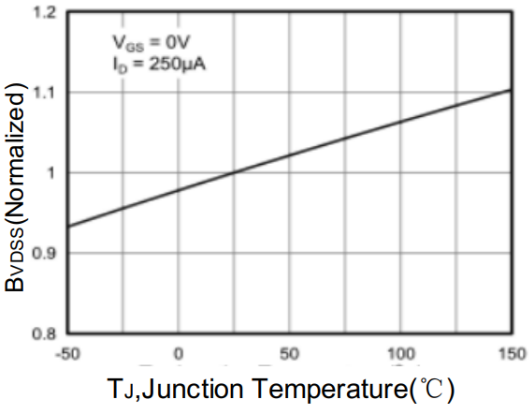


Figure 9. Breakdown Voltage vs. Junction Temperature

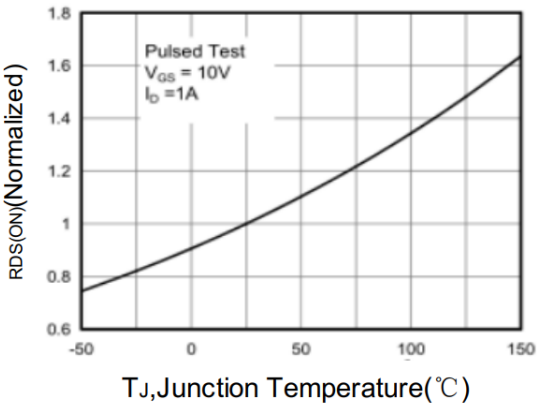
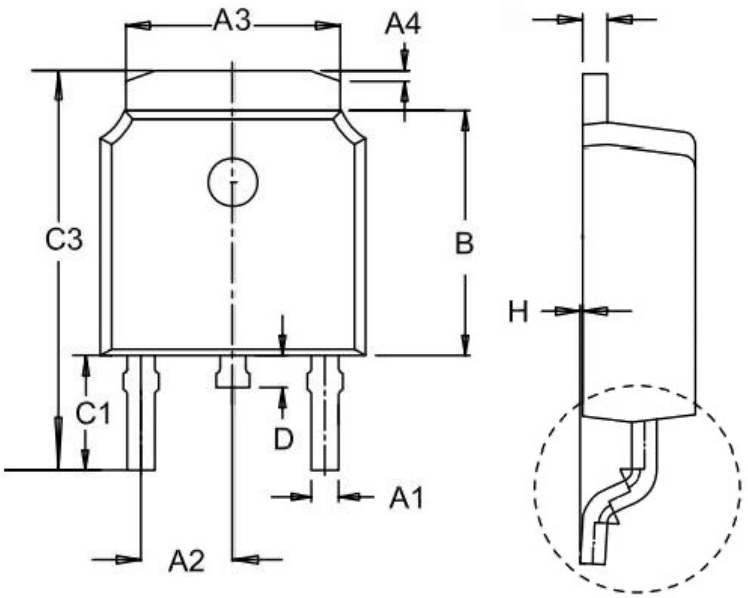
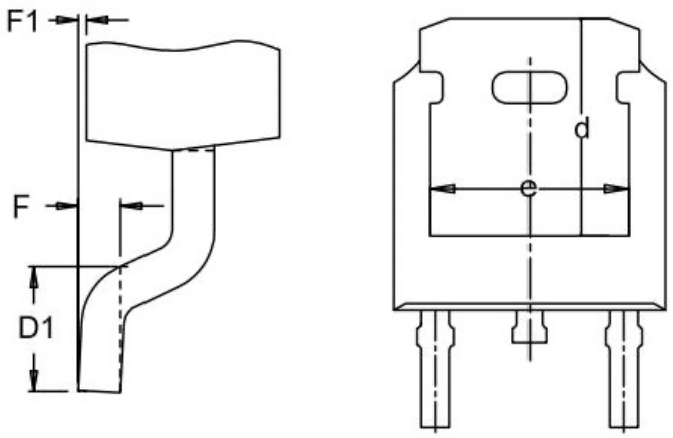


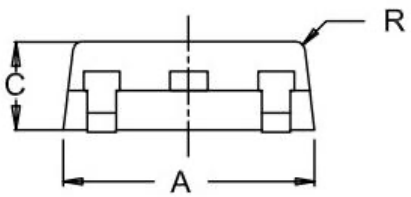
Figure 10. On-Resistance vs. Temperature

Package Outline

Unit : mm







SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	6.55	6.60	6.65
A1	0.64	0.69	0.74
A2	-	2.286	-
A3	5.234	5.334	5.434
A4	0.07	0.27	0.47
B	6.05	6.10	6.15
C	2.25	2.30	2.35
C1	2.65	2.78	2.95
C2	0.504	0.508	0.510
C3	9.75	9.85	10.0
D	0.70	0.80	0.90
D1	1.40	1.50	1.60
F	-	0.508	-
F1	0	0.05	0.10
H	0	0.05	0.10
R	-	0.25	-