RTK16N65C

16N65C – 650V 16A N-channel Si Power MOSFET

PowerCubeSemi, Inc.
Potential · Convergence · Smart

Features

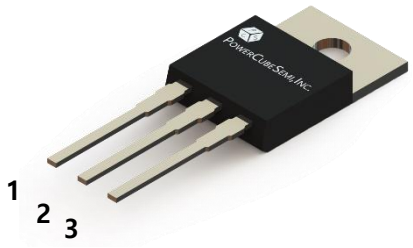
- Low $R_{DS(ON)}$
- Low gate charge (typ. Q_G=53.9nC)
- 100% UIS tested

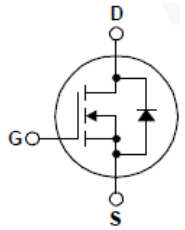
Applications

- Power Factor Correction
- Switched mode power supplies
- LED Driver

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		650	V
V_{GSS}	Gate to Source Voltage		±30	
T_J	Maximum Junction Temperature		150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
dv/dt	Peak diode recovery dv/dt[3]		5	V/ns
I_D	Continuous Drain Current (V_{GS}=10V)	T_C=25℃	16	A
		T_C=100℃	11.5	
I_{DM}	Pulsed Drain Current[1]	T_C=25℃	64	A
P_D	Power dissipation	T_C=25℃	180	W
E_{AS}	Avalanche Energy, Single Pulsed[2]		605	mJ

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	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, 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	-	4	V
$R_{DS(ON)}$	Static Drain-Source on state resistance	V_{GS} = 10V, I_D = 8A	-	0.48	0.6	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
C_{iss}	Input capacitance	V_{DS}=25V, V_{GS}=0V, f=1㎒	-	2640	-	pF
C_{oss}	Output capacitance		-	235	-	
C_{rss}	Reverse transfer capacitance		-	15	-	
$t_{d(on)}$	Turn-on Delay time	V_{DS}=325V, I_D=16A, V_{GS}=15V, R_G=10Ω	-	15.4	-	ns
T_r	Turn-on Rise time		-	41	-	
$t_{d(off)}$	Turn-off Delay time		-	88.7	-	
T_f	Turn-off Fall time		-	17.8	-	

Gate Charge Characteristics

Symbol	Parameter	Test Condition	Numerical			Unit
			Min	Typ.	Max.	
$Q_{g(tot)}$	Total gate charge at 10V	V_{DS}=520V, I_D=16A $V_{GS(on)}$=10V	-	53.9	-	nC
Q_{gs}	Gate to source gate charge		-	13.4	-	
Q_{gd}	Gate to drain "Miller" charge		-	20.1	-	

Diode Characteristics

Symbol	Parameter	Test Condition	Numerical		Unit
			Typ.	Max.	
I_S	Diode Continuous Forward Current		-	16	A
$I_{S,\ pulse}$	Diode Pulsed Current		-	64	A
V_{SD}	Drain to source diode forward voltage	I_{SD}=16A, V_{GS} = 0V	-	1.5	V
T_{rr}	Reverse recovery time	I_F=16A, V_R=325V, dI_F/dt=100A/μs	448.4	-	ns
Q_{rr}	Reverse recovery charge		5.38	-	μC
I_{rrm}	Reverse recovery current		24	-	A

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.69	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	

NOTE

1 : Pulse width limited by maximum junction temperature.

2 : L=10mH, I_{AS}=11A, Starting T_J=25℃

3 : I_{SD}=16A, di/dt≤100A/us, V_{DD}≤BV_{DS}, Starting T_J=25℃

Typical Characteristics

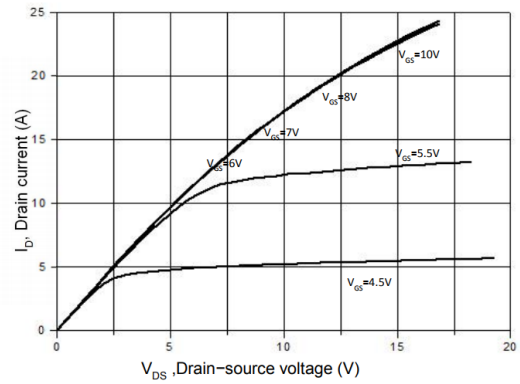


Figure 1. Typical output characteristics

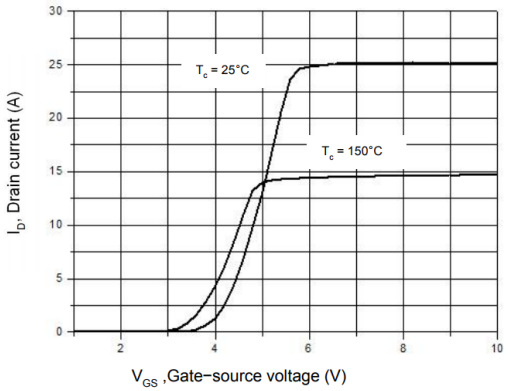


Figure 2. Transfer Characteristics

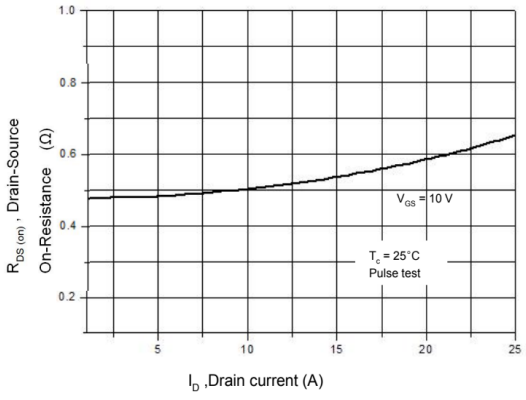


Figure 3. On-resistance variation vs. Drain current

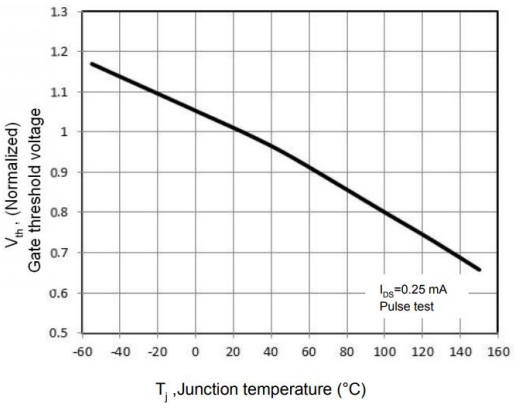


Figure 4. Threshold voltage vs. Temperature

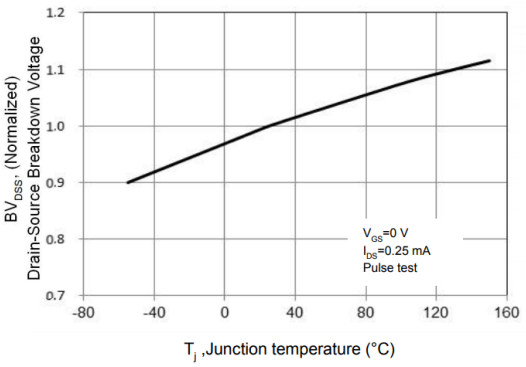


Figure 5. Breakdown Voltage vs. Temperature

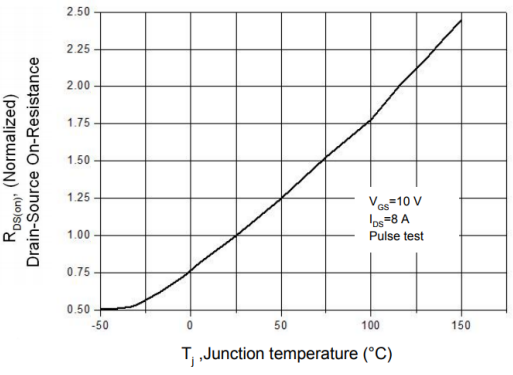


Figure 6. On-resistance vs. Temperature

Typical Characteristics

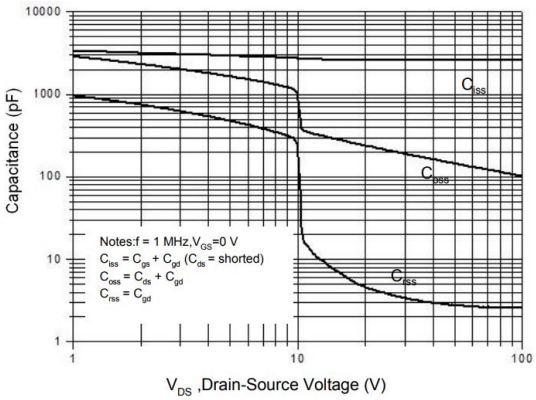


Figure 7. Capacitance Characteristics

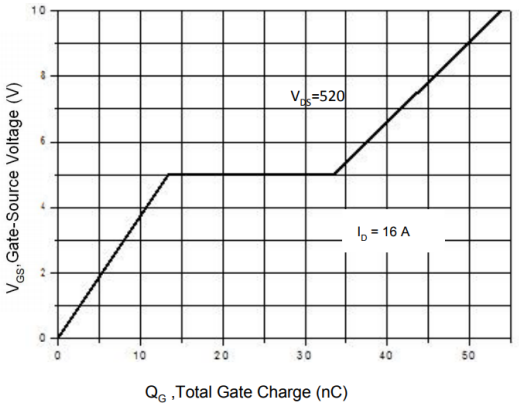


Figure 8. Gate Charge Characteristics

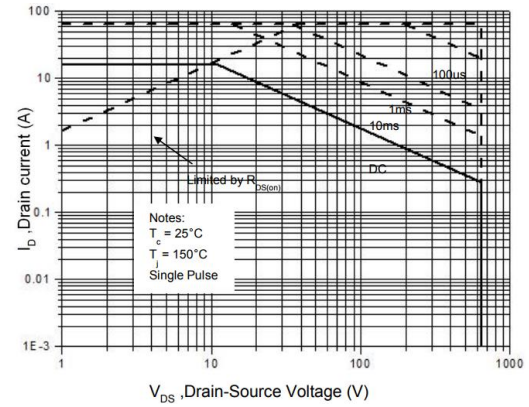


Figure 9. Maximum Safe Operating Area

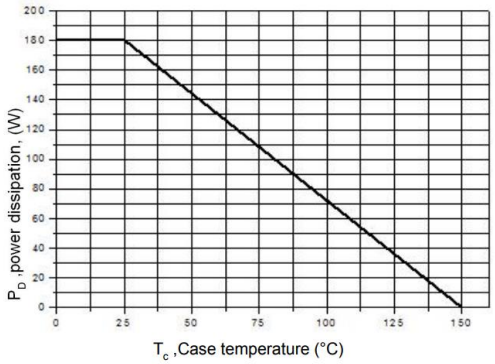


Figure 10. Power Dissipation vs. Temperature

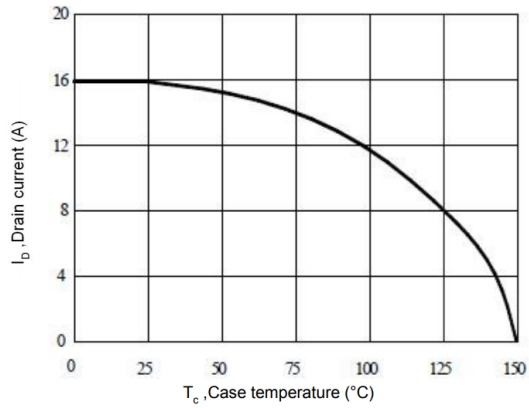


Figure 11. Continuous Drain Current vs. Temperature

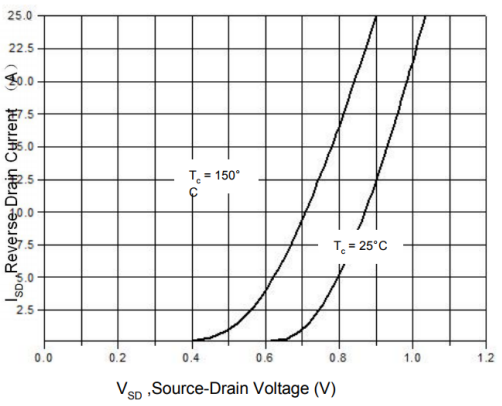


Figure 12. Body Diode Transfer Characteristics

Typical Characteristics

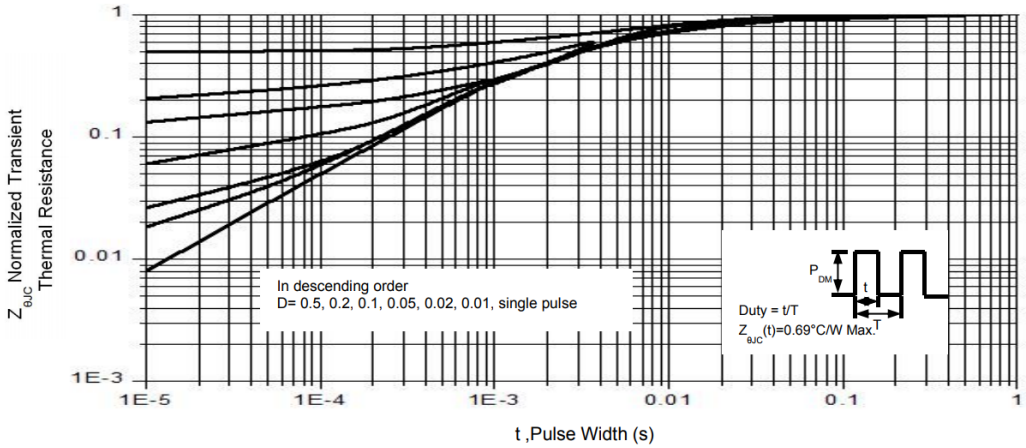
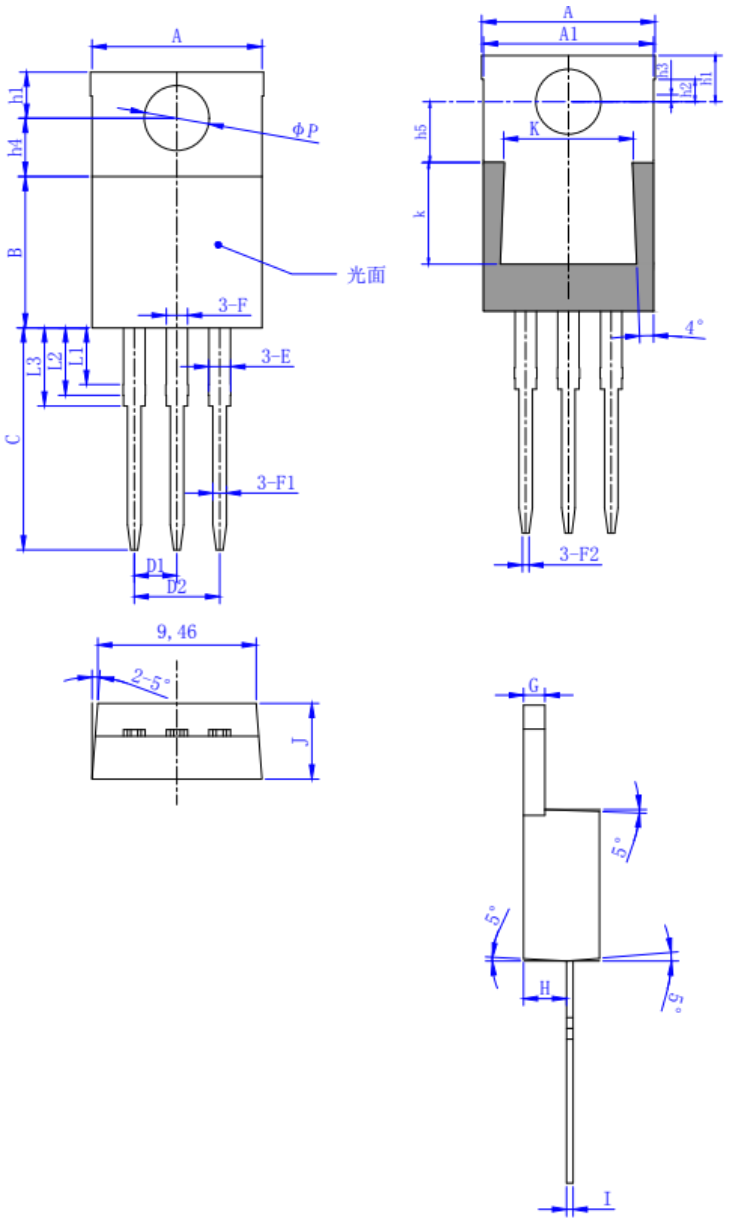


Figure 13. Transient Thermal Impedance, Junction to Case

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