

3N65-CB

Power MOSFET

3A, 650V N-CHANNEL POWER MOSFET

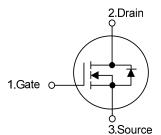
DESCRIPTION

The UTC **3N65-CB** is a high voltage power MOSFET designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and high rugged avalanche characteristics. This power MOSFET is usually used in high speed switching applications of switching power supplies and adaptors.

FEATURES

- * $R_{DS(ON)}$ < 2.8 Ω @ V_{GS} = 10 V, I_D = 1.5 A
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

SYMBOL



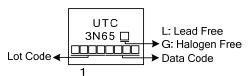
ORDERING INFORMATION

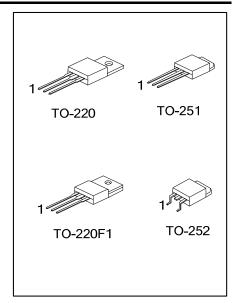
Ordering Number		Daakaga	Pin Assignment			Dooking	
Lead Free	Halogen Free	– Package	1	2	3	Packing	
3N65L-TA3-T	3N65G-TA3-T	TO-220	G	D	S	Tube	
3N65L-TF1-T	3N65G-TF1-T	TO-220F1	G	D	S	Tube	
3N65L-TM3-T	3N65G-TM3-T	TO-251	G	D	S	Tube	
3N65L-TN3-R	3N65G-TN3-R	TO-252	G	D	S	Tape Reel	

Note: Pin Assignment: G: Gate D: Drain S: Source

3N65 <u>G</u> - <u>TA3</u> -T	(1)Packing Type (2)Package Type	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TM3: TO-251, TN3: TO-252
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING





■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	650	V
Gate-Source Voltage		V _{GSS}	±30	V
Continuous Drain Cur	Continuous Drain Current		3	А
Pulsed Drain Current	(Note 2)	I _{DM}	12	А
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	112	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4	V/ns
	TO-220		75	W
Power Dissipation	VGSS in Current ID urrent (Note 2) IDM gy Single Pulsed (Note 3) EAS covery dv/dt (Note 4) dv/dt TO-220 TO-220F1 PD TO-251/TO-252 PD TO-251/TO-252	PD	34	W
	TO-251/TO-252		50	W
Junction Temperature		TJ	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. L = 25mH, I_{AS} = 3.0A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25°C

4. I_{SD} \leq 3.0A, di/dt \leq 200A/µs, V_{DD} \leq BV_{DSS}, Starting T_J = 25°C

THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT	
Junction to Ambient	TO-220/TO-220F1	0	62.5	°C/W	
	TO-251/TO-252	θ_{JA}	110		
Junction to Case	TO-220		1.67	°C/W	
	TO-220F1	$\theta_{\rm JC}$	3.68		
	TO-251/TO-252		2.5		



PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V, I _D = 250µA	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			10	μA
Gate- Source Leakage Current	Forward	- I _{GSS}	V _{GS} = 30V, V _{DS} = 0V			100	nA
	Reverse		$V_{GS} = -30V, V_{DS} = 0V$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} = 10V, I _D = 1.5A			2.8	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}			490		рF
Output Capacitance		C _{OSS}	V _{DS} =25V, V _{GS} =0V, f=1.0 MHz		50		pF
Reverse Transfer Capacitance		C _{RSS}			6		рF
SWITCHING CHARACTERISTIC	S						
Total Gate Charge (Note 1)		Q_{G}	-V _{DS} =50V, V _{GS} =10V, I _D =1.3A, -I _D =100μA (Note 1, 2)		25		nC
Gate-Source Charge		Q_{GS}			3.4		nC
Gate-Drain Charge		Q_{GD}			3		nC
Turn-On Delay Time (Note 1)		t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =0.5A,		40		ns
Turn-On Rise Time		t _R			20		ns
Turn-Off Delay Time		t _{D(OFF)}	R _G =25Ω (Note 1, 2)		108		ns
Turn-Off Fall Time		t⊨			23		ns
DRAIN-SOURCE DIODE CHARA	CTERISTIC	CS AND MAX	(IMUM RATINGS				
Maximum Continuous Drain-Source Diode		I _S				3	А
Forward Current						3	А
Maximum Pulsed Drain-Source Diode		I _{SM}				12	А
Forward Current						12	A
Drain-Source Diode Forward Voltage		V_{SD}	I _S =3.0A , V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =3.0A , V _{GS} =0V di/dt=100A/µs		274		ns
Body Diode Reverse Recovery Charge		Q _{rr}	$v_{\rm GS}$ = 0.0A, $v_{\rm GS}$ = 0V ul/ul = 100A/µS		1.66		μC
Natao 4 Dulas Testi Dulas width							-

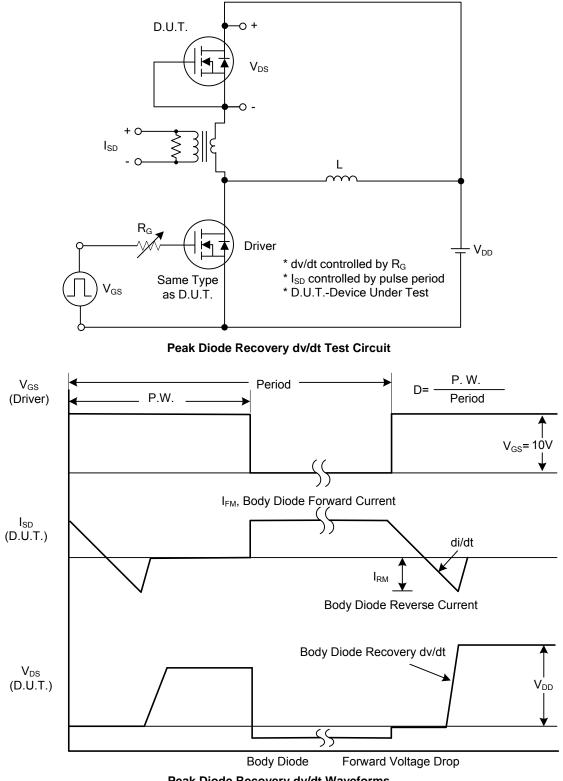
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

Notes: 1. Pulse Test: Pulse width \leq 300µs, Duty cycle \leq 2%

2. Essentially independent of operating temperature



TEST CIRCUITS AND WAVEFORMS

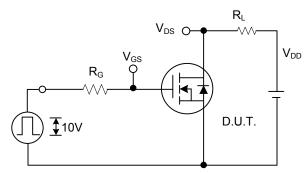


Peak Diode Recovery dv/dt Waveforms

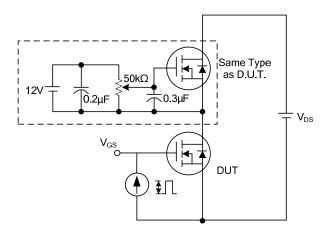


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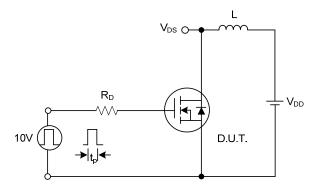
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



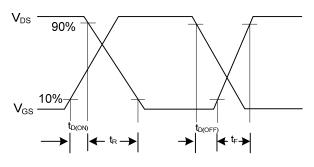


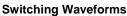


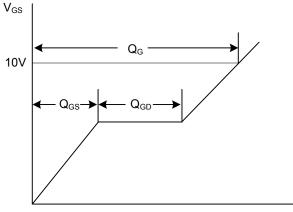
Gate Charge Test Circuit



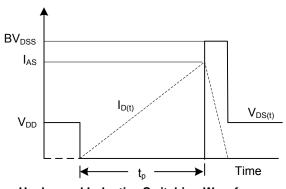
Unclamped Inductive Switching Test Circuit







Charge Gate Charge Waveform



Unclamped Inductive Switching Waveforms



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