

UTC UNISONIC TECHNOLOGIES CO., LTD

4N65-C

4A, 650V N-CHANNEL **POWER MOSFET**

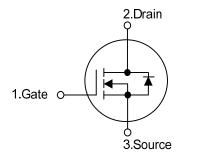
DESCRIPTION

The UTC 4N65-C is a high voltage power MOSFET designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristic. This power MOSFET is usually used in high speed switching applications including power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

FEATURES

- * $R_{DS(ON)}$ < 3.0 Ω @ V_{GS} = 10 V, I_D = 2A
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness

-**SYMBOL**

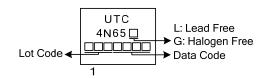


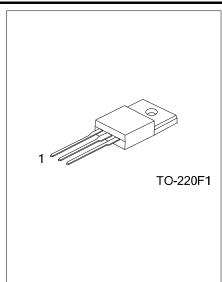
ORDERING INFORMATION

Ordering Number		Dookago	Pin Assignment			Packing	
Lead Free	Halogen Free	Package	1	2	3	Facking	
4N65L-TF1-T	4N65G-TF1-T	TO-220F1	G	D	S	Tube	
Note: Pin Assignment: (Gate D'Drain S'S	ource					

4N65 <u></u> Ļ- <u>TF1</u> -Ţ		
	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) TF1: TO-220F1
	(3)Green Package	(3) L: Lead Free, G: Halogen Free and Lead Free

MARKING





Power MOSFET

■ **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
Avalanche Current (Note2)		I _{AR}	4.0	А
Durin Ourmant	Continuous	I _D	4.0	А
Drain Current	Pulsed (Note2)	I _{DM}	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	А
Avelopebo Eporev	Single Pulsed (Note3)	E _{AS}	150	mJ
Avalanche Energy	Repetitive (Note2)	E _{AR}	5.6	mJ
Peak Diode Recovery dv/dt (Note4)		dv/dt	3.6	V/ns
Power Dissipation		PD	36	W
Junction Temperature		TJ	+150	°C
Operating Temperature		T _{OPR}	-55 ~ +150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

Note: 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 = 18.75mH, I_{AS} = 4A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25°C

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

THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ _{JC}	3.47	°C/W



PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS		OTHIDOL		1		1111 0 1	0.111
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0 V, I _D = 250µA	650			V
Drain-Source Leakage Current		I _{DSS}	$V_{DS} = 650 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			10	μA
			V _{DS} = 480 V, T _C =125°C			100	μA
Gate-Source Leakage Current	Forward	- I _{GSS}	V _{GS} = 30 V, V _{DS} = 0 V			100	nA
	Reverse		V _{GS} = -30 V, V _{DS} = 0 V			-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 Re	esistance	R _{DS(ON)}	V_{GS} = 10 V, I_{D} = 2A			3.0	Ω
DYNAMIC CHARACTERISTICS	6						
Input Capacitance	Input Capacitance		-V _{DS} = 25 V, V _{GS} = 0V, f = 1MHz		425		рF
Output Capacitance		C _{ISS} C _{OSS}			55		рF
Reverse Transfer Capacitance		C _{RSS}			5.8		рF
SWITCHING CHARACTERISTI	CS						
Total Gate Charge		Q_{G}	-V _{DS} =50V, I _D =1.3A, I _G =100μA -V _{GS} =10V (Note 1, 2)		16.5		nC
Gate-Source Charge		Q_{GS}			4		nC
Gate-Drain Charge		Q_{GD}	VGS-10V (Note 1, 2)		3.4		nC
Turn-On Delay Time		t _{D(ON)}			37		ns
Turn-On Rise Time		t _R	V_{DS} =30V, I_{D} =0.5A, R_{G} =25 Ω		33		ns
Turn-Off Delay Time		t _{D(OFF)}	(Note 1, 2)		45		ns
Turn-Off Fall Time		t _F			40		ns
SOURCE- DRAIN DIODE RATI	NGS AND	CHARACTERI	STICS				
Drain-Source Diode Forward Vo	ltage	V_{SD}	$V_{GS} = 0 V, I_{S} = 4.0A$			1.4	V
Maximum Continuous Drain-Sou	urce					4.0	А
Diode Forward Current		Is				4.0	A
Maximum Pulsed Drain-Source	Diode	I _{SM}				16	А
Forward Current		ISM				10	Л
Body Diode Reverse Recovery	Time	t _{RR}			320		ns
Body Diode Reverse Recovery Charge		Q _{RR}			2.0		nC

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

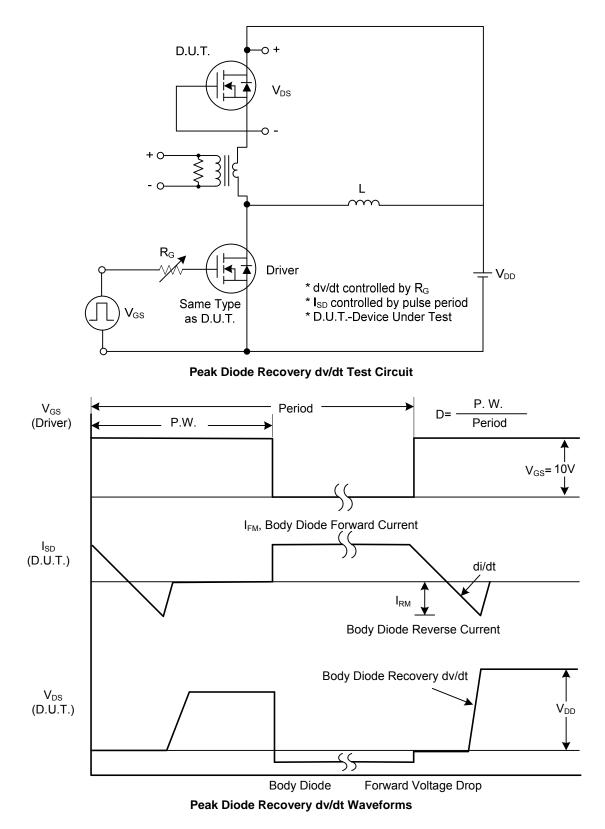
Notes: 1. Pulse Test: Pulse width \leq 300µs, Duty cycle \leq 2%.

2. Essentially independent of operating temperature.



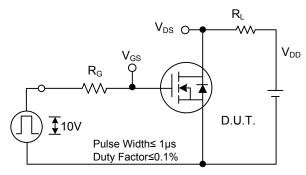
4N65-C

TEST CIRCUITS AND WAVEFORMS

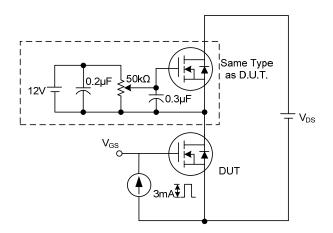


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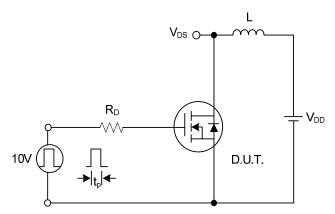
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



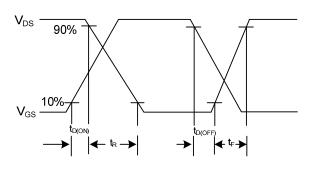
Switching Test Circuit



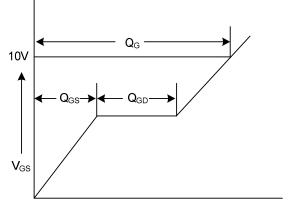
Gate Charge Test Circuit



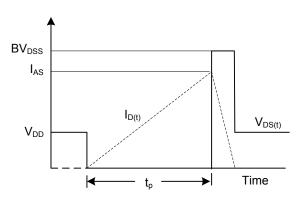
Unclamped Inductive Switching Test Circuit



Switching Waveforms



Charge Gate Charge Waveform



Unclamped Inductive Switching Waveforms



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