



22N65

Preliminary

Power MOSFET

HEXFET POWER MOSFET

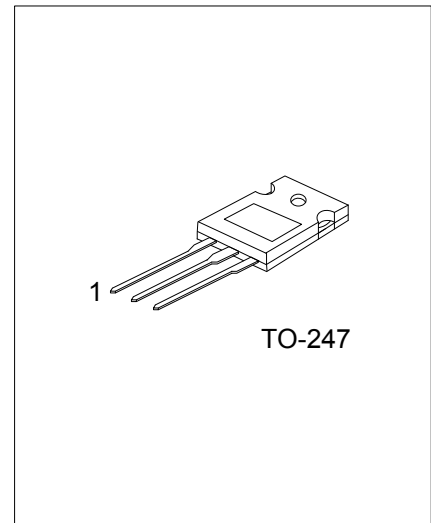
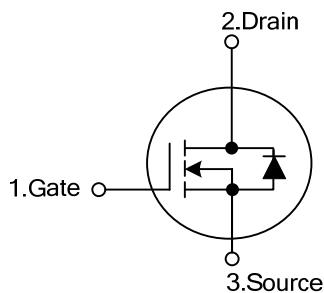
DESCRIPTION

As the SMPS MOSFET, the UTC **22N65** uses UTC's advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $R_{DS(ON)} = 350 \Omega$
- * Ultra low gate charge (Typical 150 nC)
- * Low reverse transfer capacitance ($C_{RSS} =$ typical 36 pF)
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen Free		1	2	3	
22N65L-T47-T	22N65G-T47-T	TO-247	G	D	S	Tube

22N65L-T47-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) T47: TO-247
	(3)Lead Free	(3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	650	V
Gate-Source Voltage	V_{GSS}	± 30	V
Avalanche Current	I_{AR}	22	A
Continuous Drain Current	I_D	22	A
Pulsed Drain Current (Note 1)	I_{DM}	88	A
Avalanche Energy	Single Pulsed	E_{AS}	380
	Repetitive	E_{AR}	37
Peak Diode Recovery dv/dt (Note 2)	dv/dt	18	V/ns
Power Dissipation	P_D	370	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

Note: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. $I_{SD} \leq 22\text{A}$, $di/dt \leq 540\text{ A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$.

3. 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	40	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.34	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS

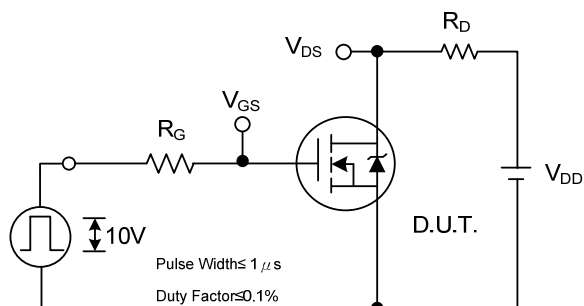
($T_J = 25^\circ\text{C}$, $L = 1.5\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 22\text{A}$. Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V$			50	μA
Gate- Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=1mA$, Referenced to 25°C		0.30		V/°C
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-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=13A$ (Note 2)		0.3	0.35	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		3570		pF
Output Capacitance	C_{OSS}			350		pF
Reverse Transfer Capacitance	C_{RSS}			36		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=300V, I_D=22A, R_G=6.2\Omega$ $V_{GS}=10V$ (Note 2)		26		ns
Turn-ON Rise Time	t_R			99		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			48		ns
Turn-OFF Fall-Time	t_F			37		ns
Total Gate Charge	Q_G	$V_{DS}=480V, V_{GS}=10V, I_D=22A$ (Note 2)			150	nC
Gate Source Charge	Q_{GS}				45	nC
Gate Drain Charge	Q_{GD}				76	nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=22A$			1.5	V
Continuous Source Current (Body Diode) (Note 1)	I_S				22	A
Pulsed Source Current (Body Diode)	I_{SM}				88	A
Reverse Recovery Time	t_{RR}	$I_S=22A$,		590	890	ns
Reverse Recovery Charge	Q_{RR}	$di/dt=100A/\mu s$ (Note 2)		7.2	11	μC

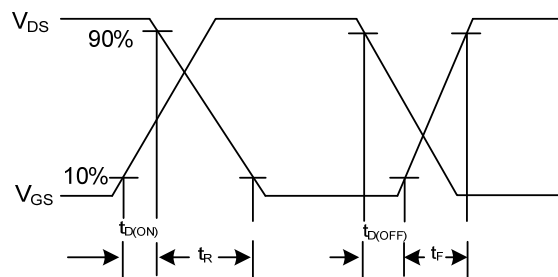
Note: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Pulse Width $\leq 300\text{ s}$, Duty Cycle $\leq 2\%$.

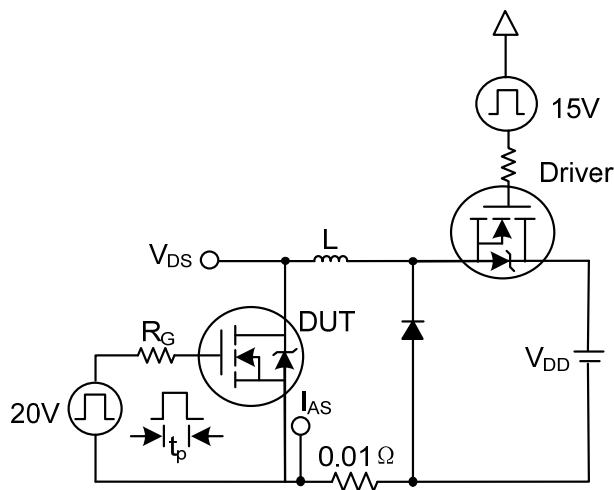
■ TEST CIRCUITS



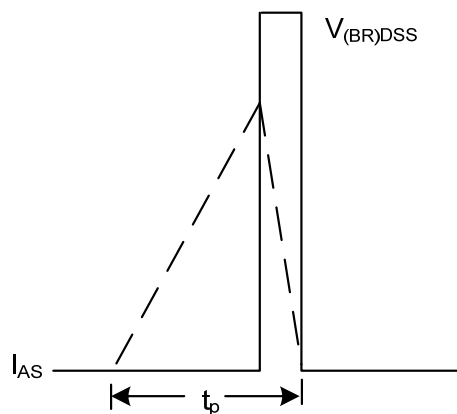
Switching Test Circuit



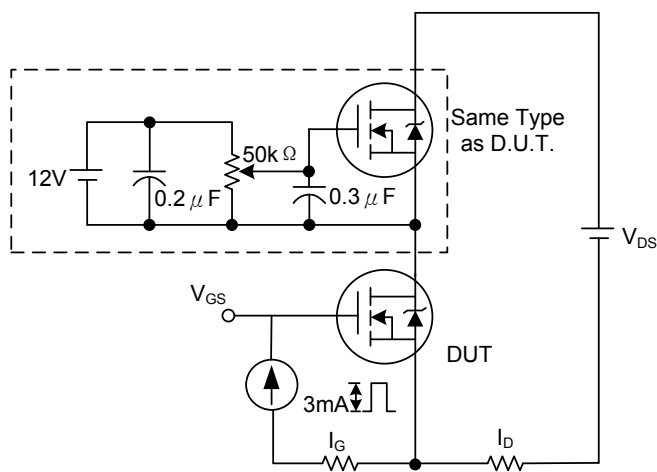
Switching Waveforms



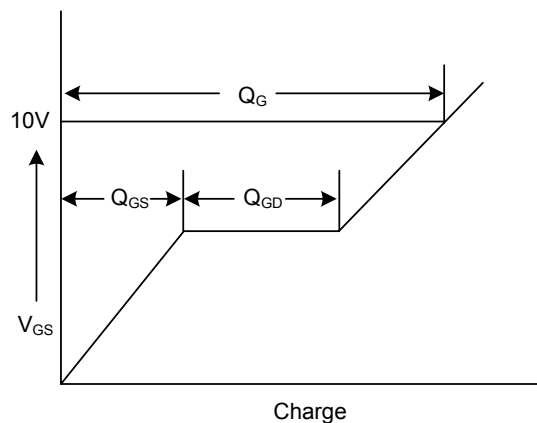
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

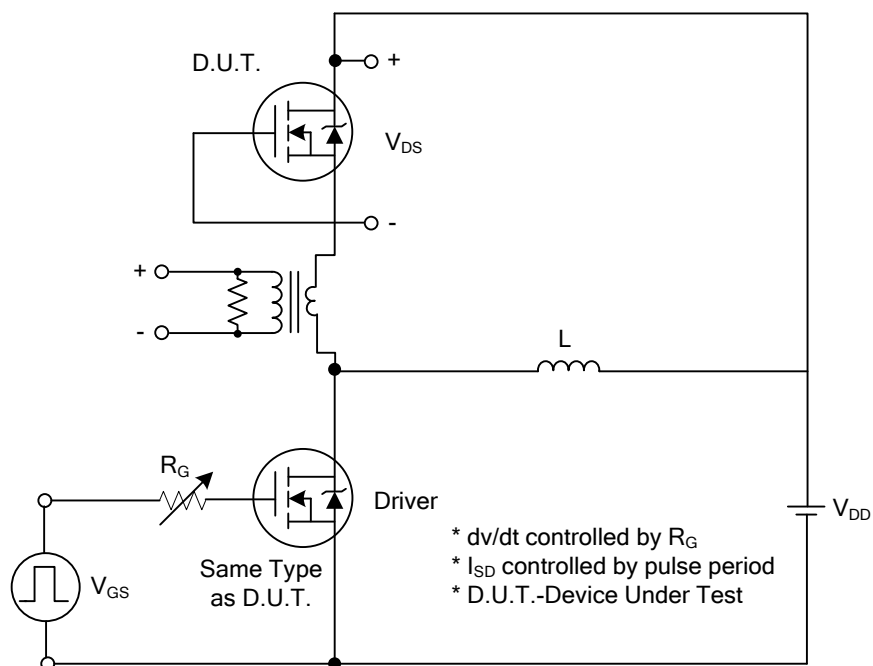
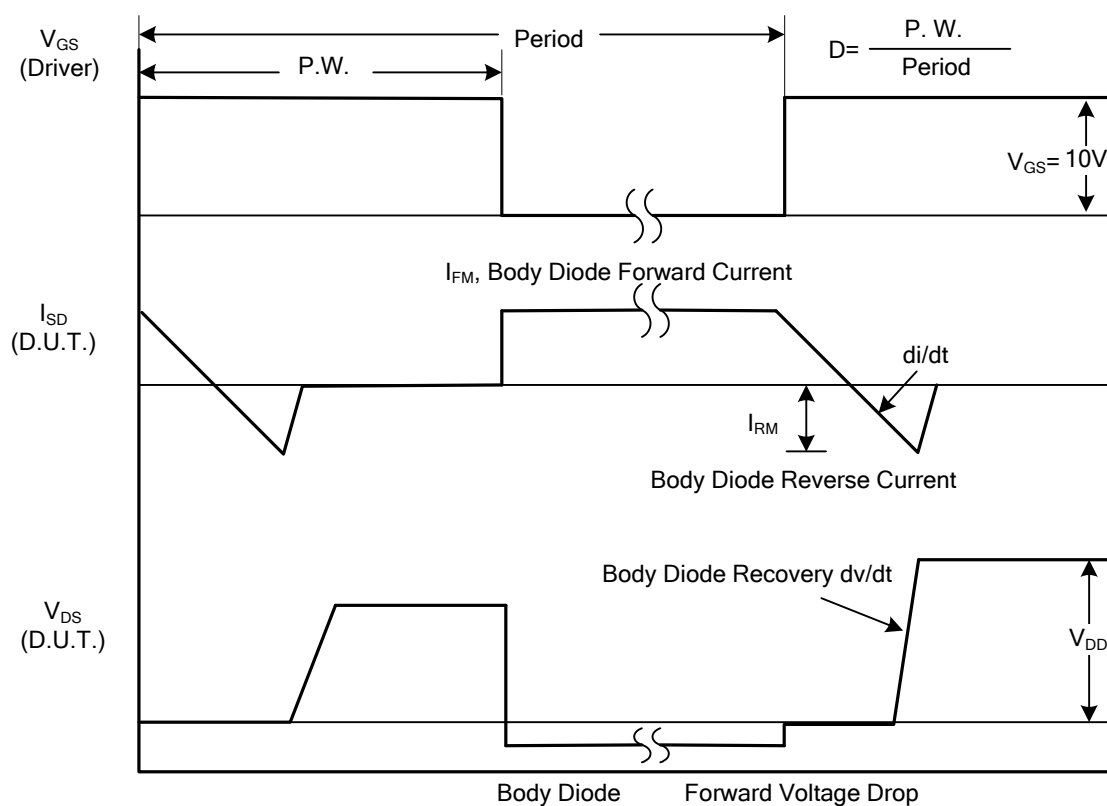


Gate Charge Test Circuit



Gate Charge Waveform

■ TEST CIRCUITS(Cont.)

Fig. 1A Peak Diode Recovery dv/dt Test Circuit

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