

**15N65**

Preliminary

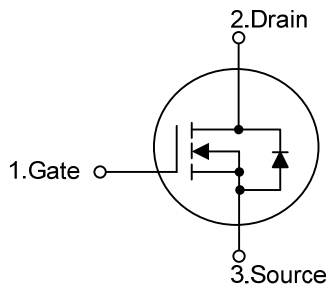
Power MOSFET**15A, 650V N-CHANNEL
POWER MOSFET**■ **DESCRIPTION**

The UTC **15N65** is an N-channel mode power MOSFET using UTC's advanced technology to provide costumers with planar stripe and DMOS technology. This technology is specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **15N65** is universally applied in active power factor correction and high efficient switched mode power supplies.

■ **FEATURES**

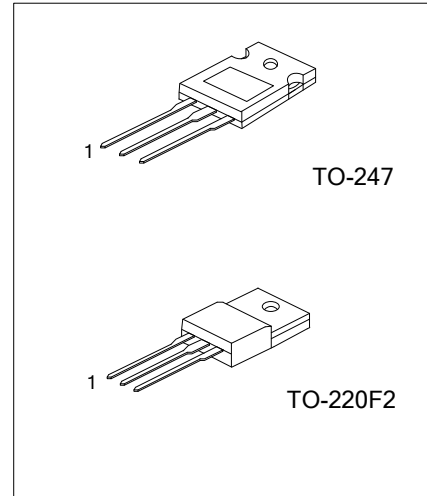
- * $R_{DS(ON)}=0.65\Omega$ @ $V_{GS}=10V$
- * Typically 23.6pF low C_{RSS}
- * High switching speed
- * Improved dv/dt capability

■ **SYMBOL**■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
15N65L-TF2-T	15N65G-TF2-T	TO-220F2	G	D	S	Tube
15N65L-T47-T	15N65G-T47-T	TO-247	G	D	S	Tube

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

15N65L-TF2-T (1) Packing Type (2) Package Type (3) Lead Free	(1) T: Tube (2) TF2: TO-220F2, T47: TO-247 (3) G: Halogen Free, L: Lead Free
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■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	650	V
Gate to Source Voltage		V_{GSS}	± 30	V
Avalanche Current (Note 2)		I_{AR}	15	A
Continuous Drain Current	Continuous	I_D	15	A
	Pulsed (Note 2)	I_{DM}	60	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	637	mJ
	Repetitive (Note 2)	E_{AR}	25.0	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation	TO-220F2	P_D	38.5	W
	TO-247		312	
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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. $L=5.23\text{mH}$, $I_{AS}=15\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$

4. $I_{SD}\leq 15\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F2	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-247		40	
Junction to Case	TO-220F2	θ_{JC}	3.3	$^{\circ}\text{C}/\text{W}$
	TO-247		0.4	

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

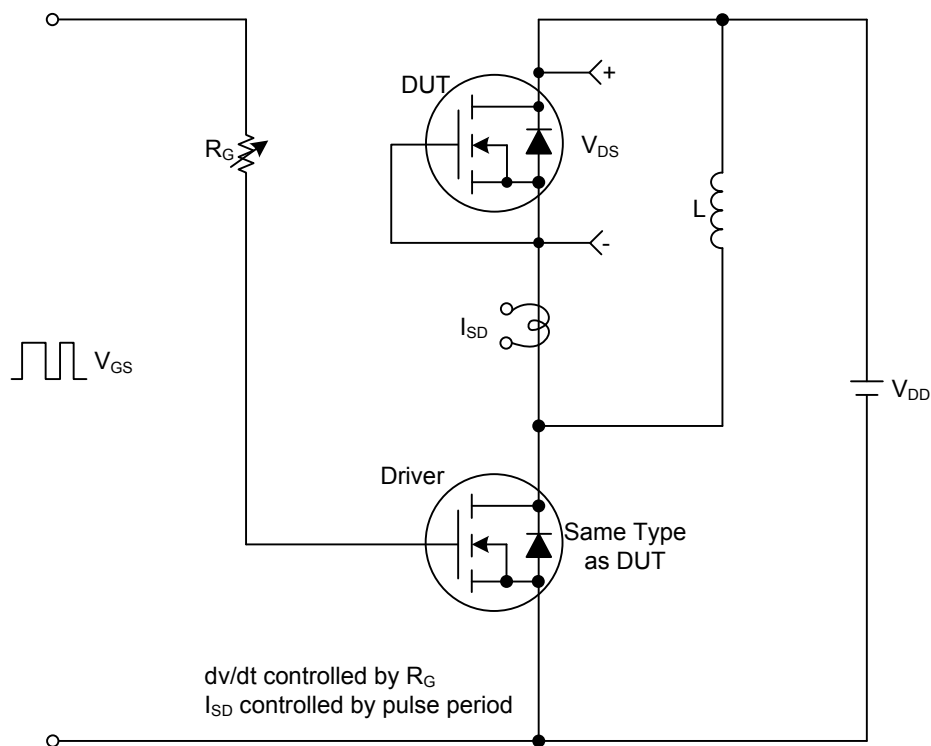
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA, T _J =25°C	650			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		0.65		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =650V, V _{GS} =0V			1	μA
			V _{DS} =520V, T _C =125°C			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 =250μA	2.0		4.0	V
Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =7.5A		0.5	0.65	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		2380	3095	pF
Output Capacitance		C _{OSS}			295	385	pF
Reverse Transfer Capacitance		C _{RSS}			23.6	35.5	pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =520V, V _{GS} =10V, I _D =15A (Note 1,2)		48.5	63.0	nC
Gate-Source Charge		Q _{GS}			14.0		nC
Gate-Drain Charge		Q _{GD}			21.2		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =325V, I _D =15A, R _G =21.7Ω (Note 1,2)		65	140	ns
Turn-ON Rise Time		t _R			125	260	ns
Turn-OFF Delay Time		t _{D(OFF)}			105	220	ns
Turn-OFF Fall Time		t _F			65	140	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				15	A
Maximum Body-Diode Pulsed Current		I _{SM}				60	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =15A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =15A,		496		ns
Body Diode Reverse Recovery Charge		Q _{RR}	dI _F /dt=100A/μs (Note 1)		5.69		μC

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

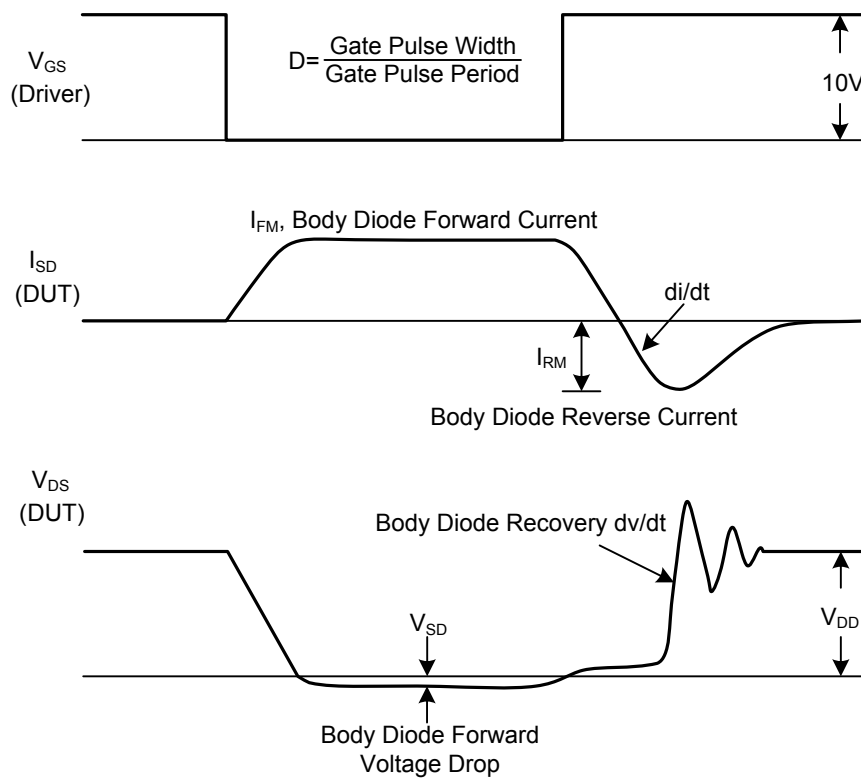
2. Essentially independent of operating temperature

3. Drain current limited by maximum junction temperature

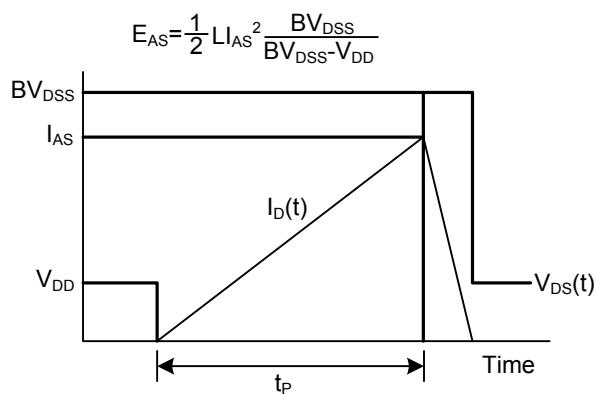
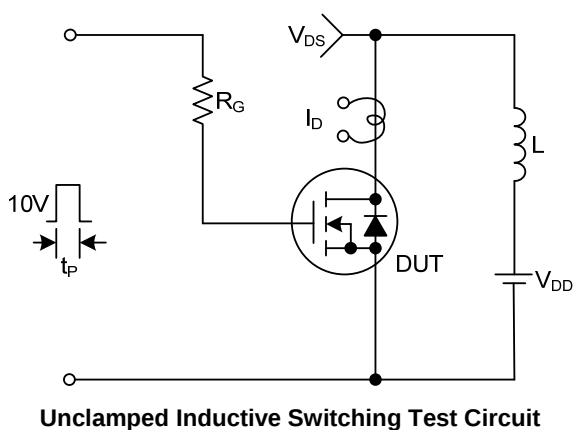
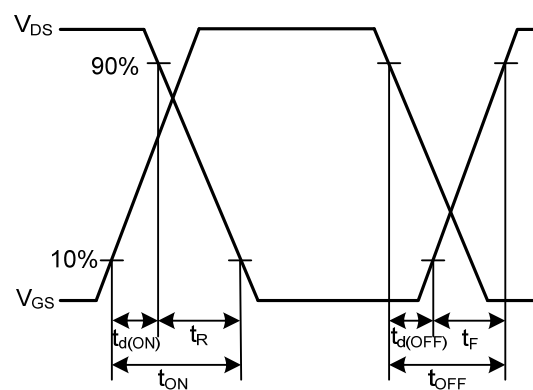
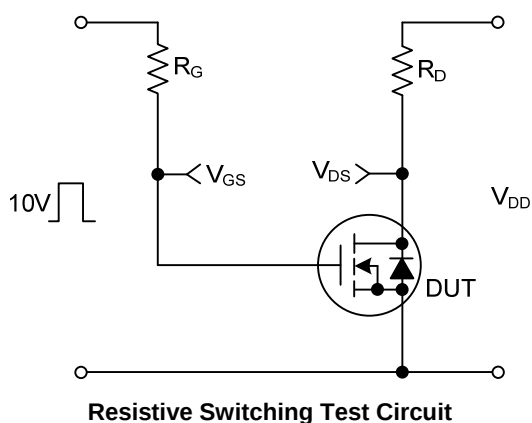
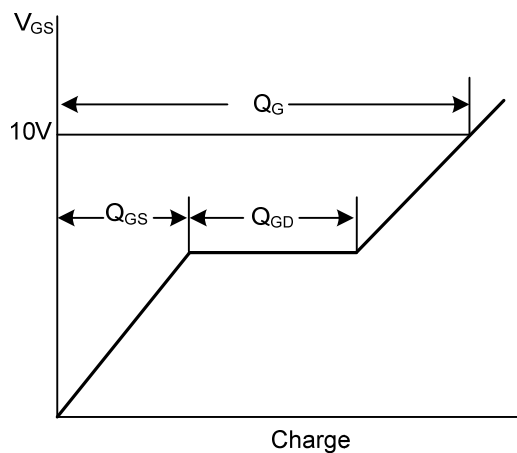
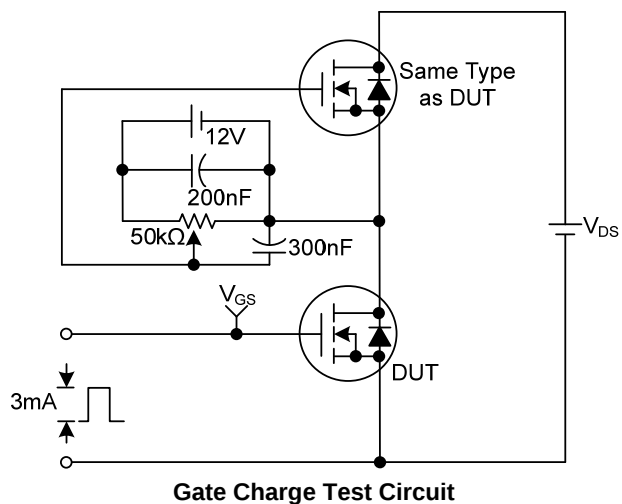
■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit & Waveforms



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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