

UNISONIC TECHNOLOGIES CO., LTD

15N65K-MT Power MOSFET

15A, 650V N-CHANNEL POWER MOSFET

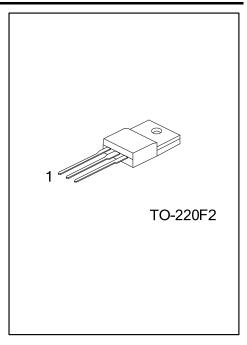
■ DESCRIPTION

The UTC 15N65K-MT is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

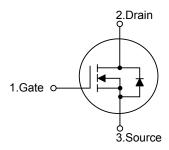
The UTC **15N65K-MT** is generally applied in high efficiency switch mode power supplies.

■ FEATURES

- * $R_{DS(ON)}$ < 0.6 Ω @ V_{GS} = 10 V, I_D = 7.5 A
- * High Switching Speed



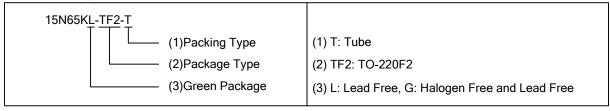
■ SYMBOL



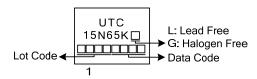
■ ORDERING INFORMATION

Ordering Number		Dookogo	Pin Assignment			Dooking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
15N65KL-TF2-T	15N65KG-TF2-T	TO-220F2	G	D	S	Tube	

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



■ MARKING



<u>www.unisonic.com.tw</u> 1 of 5

15N65K-MT Power MOSFET

■ ABSOLUTE MAXIMUM RATINGS (T_C=25°C, unless otherwise specified.) (Note 5)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain to Source Voltage		V _{DSS}	650	V	
Gate-Source Voltage		V_{GSS}	±30	V	
Drain Current	Continuous	T _C =25°C	I _D	15	Α
	Pulsed (Note 2)		I _{DM}	60	Α
Avalanche Current (Note 2)		I _{AR}	15	Α	
Avalanche Energy Single Pulsed (Note 3)		E _{AS}	750	mJ	
Peak Diode Recovery dv/dt (Note 4)		dv/dt	15	V/ns	
Power Dissipation (T _C =25°C)		D	52	W	
Derate above 25°C		P _D	0.416	W/°C	
Junction Temperature		T_J	+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=6.7mH, I_{AS} =15A. V_{DD} =50V, R_{G} =25 Ω , Starting T_{J} =25 $^{\circ}$ C
- 4. I_{SD}≤15A, di/dt≤200A/µs, V_{DD}≤BV_{DSS}, Starting T_J=25°C
- 5. Drain current limited by maximum junction temperature

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	θ_{JA}	62.5	°C/W	
Junction to Case	θ_{JC}	2.4	°C/W	

■ ELECTRICAL CHARACTERISTICS

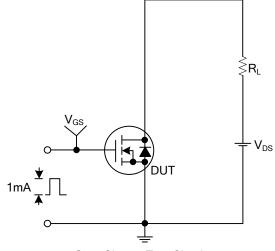
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							_
Drain-Source Breakdown Voltage		BV _{DSS}	$I_D=250\mu A, V_{GS}=0V, T_J=25^{\circ}C$	650			V
Breakdown Voltage Temperature		$\Delta BV_{DSS}/\Delta T_{J}$	Reference to 25°C, I _D =250µA		0.5		V/°C
Coefficient			Treference to 25°C, 10-250µA		0.0		V/ U
Drain-Source Leakage Current		I _{DSS}	V_{DS} =650V, V_{GS} =0V,			1	μΑ
Gate- Source Leakage Current	Forward	1000	V_{GS} =+30V, V_{DS} =0V			+100	nA
Gate- Gource Leakage Guirent	Reverse		V _{GS} =-30V , V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{GS}=V_{DS}$, $I_{D}=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =7.5A			0.60	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}			2000		pF
Output Capacitance		Coss	V_{DS} =25V, V_{GS} =0V, f=1.0MHz		210		pF
Reverse Transfer Capacitance		C_{RSS}			11		pF
SWITCHING PARAMETERS		_			-		
Turn-ON Delay Time		t _{D(ON)}			110		ns
Rise Time		t_R	V_{DS} =30V, I_{D} =0.5A, R_{G} =25 Ω		128		ns
Turn-OFF Delay Time		t _{D(OFF)}	(Note 1, 2)		244		ns
Fall-Time		t_{F}			116		ns
Total Gate Charge		Q_{G}	\\ -40\\ \\ -50\\ \ \ -4.2A		47.3		nC
Gate to Source Charge		Q_GS	V _{GS} =10V, V _{DS} =50V, I _D =1.3A (Note 1, 2)		13		nC
Gate to Drain ("Miller") Charge		Q_GD	(Note 1, 2)		13.2		nC
SOURCE- DRAIN DIODE RATIN	NGS AND	CHARACTER	ISTICS				
Maximum Body-Diode Continuous Current		I _S				15	Α
Maximum Body-Diode Pulsed Current		I _{SM}				60	Α
Drain-Source Diode Forward Voltage		V_{SD}	I _{SD} =15A, V _{GS} =0V			1.4	V

Notes: 1. Pulse Test: Pulse width≤300µs; Duty Cycle≤2%

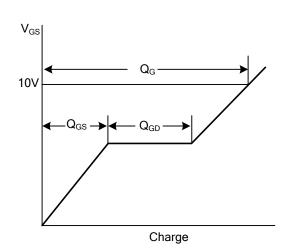
2. Essentially Independent of Operating Temperature Typical Characteristics

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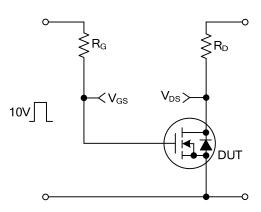
■ TEST CIRCUITS AND WAVEFORMS



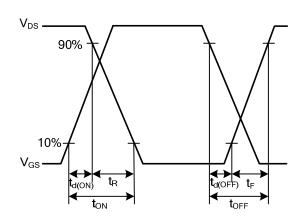
Gate Charge Test Circuit



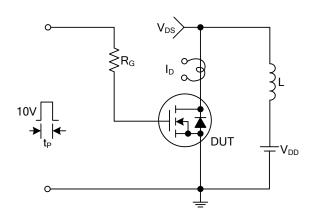
Gate Charge Waveforms



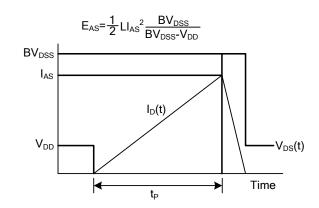
Resistive Switching Test Circuit



Resistive Switching Waveforms



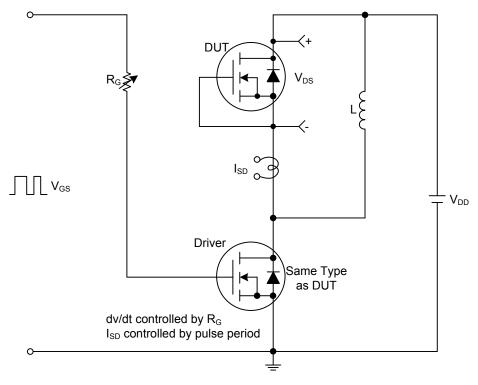
Unclamped Inductive Switching Test Circuit

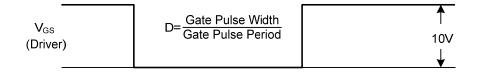


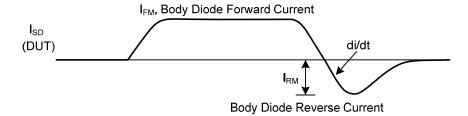
Unclamped Inductive Switching Waveforms

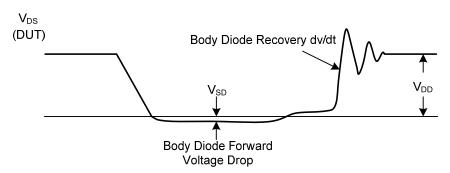
■ TEST CIRCUITS AND WAVEFORMS(Cont.)

Peak Diode Recovery dv/dt Test Circuit & Waveforms









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