

UNISONIC TECHNOLOGIES CO., LTD

17N50K-MT

Preliminary

Power MOSFET

17A, 500V N-CHANNEL POWER MOSFET

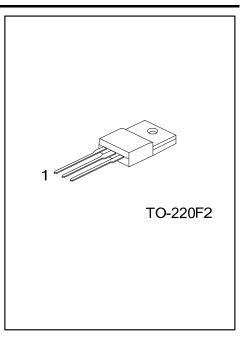
■ DESCRIPTION

The UTC 17N50K-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.

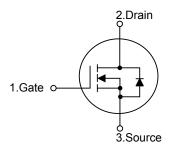
The UTC **17N50K-MT** is generally applied in high efficiency switch mode power supplies.



- * $R_{DS(ON)}$ < 0.30 Ω @ V_{GS} = 10 V, I_{D} = 8.5 A
- * High Switching Speed



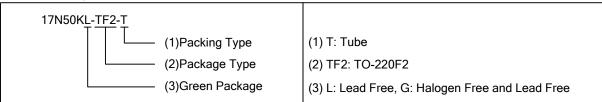
■ SYMBOL



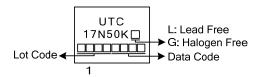
■ ORDERING INFORMATION

Ī	Ordering	Dealters	Pin	Doolsing				
	Lead Free	Halogen Free	Package	1	2	3	Packing	
	17N50KL-TF2-T	17N50KG-TF2-T	TO-220F2	G	D	S	Tube	

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



MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT	
Drain-Source Voltage			V_{DSS}	500	V	
Gate-Source Voltage			V_{GSS}	±30	V	
Drain Current	Continuous	T _C =25°C	I_D	17	Α	
Drain Current	Pulsed (Note 2)		I _{DM}	68	Α	
Avalanche Energy Single Pulsed (Note 3)		E _{AS}	911	mJ		
Power Dissipation (T _C =25°C)			J	39	W	
Derate above 25°C			P _D	3.2	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 = 6.3mH, I_{AS} = 17A, V_{DD} = 50V, R_{G} = 25 Ω , Starting T_{J} = 25 $^{\circ}$ C
- 4. $I_{SD} \le 17A$, di/dt $\le 200A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	θ_{JA}	62.5	°C/W	
Junction to Case	θ_{JC}	3.2	°C/W	

■ ELECTRICAL CHARACTERISTICS

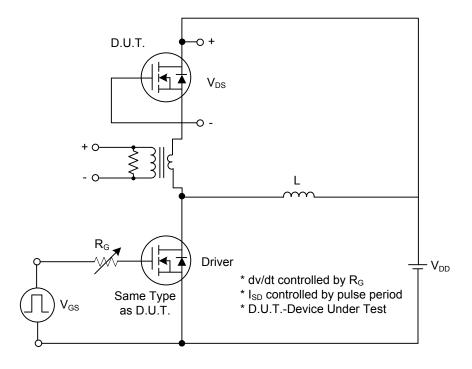
PARAMETER		SYMBOL	TEST CONDITIONS N		TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltag	е	BV _{DSS}	I _D =250μA, V _{GS} =0V	500			V
Breakdown Voltage Temperature	e Coefficient	$\triangle BV_{DSS}/\triangle T_{J}$	Reference to 25°C, I _D =250µA		0.5		V/°C
Drain-Source Leakage Current		I_{DSS}	V _{DS} =500V, V _{GS} =0V			10	μΑ
Gate- Source Leakage Current	Forward	I _{GSS}	V_{GS} =+30V, V_{DS} =0V			+100	nΑ
Gale- Source Leakage Current	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS	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} =10V, I _D =8.5A		0.22	0.30	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}			1100		pF
Output Capacitance		Coss	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		260		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		175		ns
Turn-OFF Delay Time		t _{D(OFF)}	(Note 1, 2)		305		ns
Fall-Time		t _F			168		ns
Total Gate Charge at 10V		$Q_{G(TOT)}$	V _{GS} =10V, V _{DS} =50V, I _D =1.3A		55.8		nC
Gate to Source Charge		Q_GS	(Note 1, 2)		14.9		nC
Gate to Drain Charge		Q_GD	(14010-1, 2)		16		nC
SOURCE- DRAIN DIODE RATII	NGS AND C	HARACTERIS	TICS				
Maximum Body-Diode Continuou	us Current	Is				17	Α
Maximum Body-Diode Pulsed Co	urrent	I _{SM}				68	Α
Drain-Source Diode Forward Vol	ltage	V_{SD}	I _{SD} =17A, V _{GS} =0V			1.5	V

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

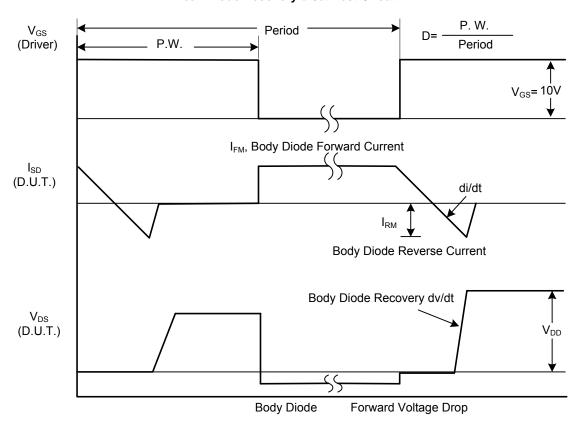
2. Essentially Independent of Operating Temperature Typical Characteristics.



■ TEST CIRCUITS AND WAVEFORMS

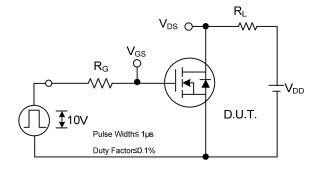


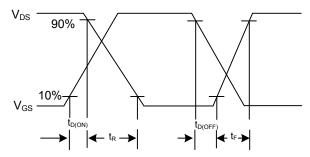
Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms

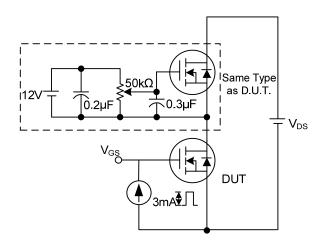
■ TEST CIRCUITS AND WAVEFORMS (Cont.)

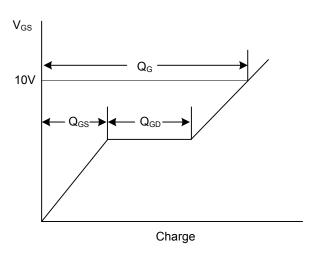




Switching Test Circuit

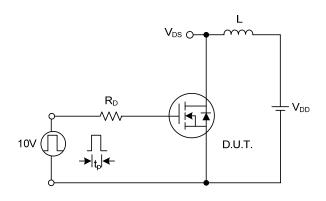
Switching Waveforms

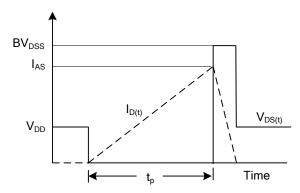




Gate Charge Test Circuit

Gate Charge Waveform





Unclamped Inductive Switching Test Circuit

Unclamped Inductive Switching Waveforms

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