

Power MOSFET

10A, 700V N-CHANNEL **POWER MOSFET**

DESCRIPTION

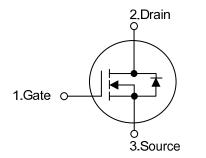
The UTC 10N70K-MT is an N-channel Power MOSFET using UTC's advanced technology to provide customers a minimum on-state resistance and superior switching performance, etc.

The UTC 10N70K-MT is generally applied in high efficient DC to DC converters, PWM motor controls and bridge circuits, etc.

FEATURES

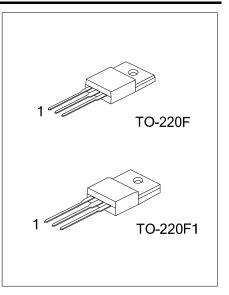
- * $R_{DS(ON)}$ < 1.08 Ω @ V_{GS} = 10V, I_D = 5.0A
- * High Switching Speed
- * Improved dv/dt capability

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free	Гаскауе	1	2	3	Facking
10N70KL-TF1-T	10N70KG-TF1-T	TO-220F1	G	D	S	Tube
10N70KL-TF3-T 10N70KG-TF3-T		TO-220F	G	D	S	Tube
Note: Pin Assignment: G:	Gate D: Drain S: Sou	irce				
10N70KG- <u>TF1</u> -T	 (1) T: Tube (2) TF1: TO-220F1, TF3: TO-220F (3) G: Halogen Free and Lead Free, L: Lead Free 					
■ MARKING UTC 10N70K UTC 10N70K	L: Lead Free ➔ G: Halogen Free ➔ Date Code	NWW. FIVI	有191	000		
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ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V _{DSS}	700	V	
Gate-Source Voltage		V _{GSS}	± 30	V	
Drain Current	Continuous	I _D	10	А	
	Pulsed (Note 2)	I _{DM}	20	А	
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	252	mJ	
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.3	V/ns	
Power Dissipation		PD	50	W	
Junction Temperature		TJ	+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 = 30mH, I_{AS} = 4.1A, V_{DD} = 50V, R_G = 25 Ω Starting T_J = 25°C

4. $I_{SD} \le 10A$, di/dt $\le 200A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$

THERMAL DATA

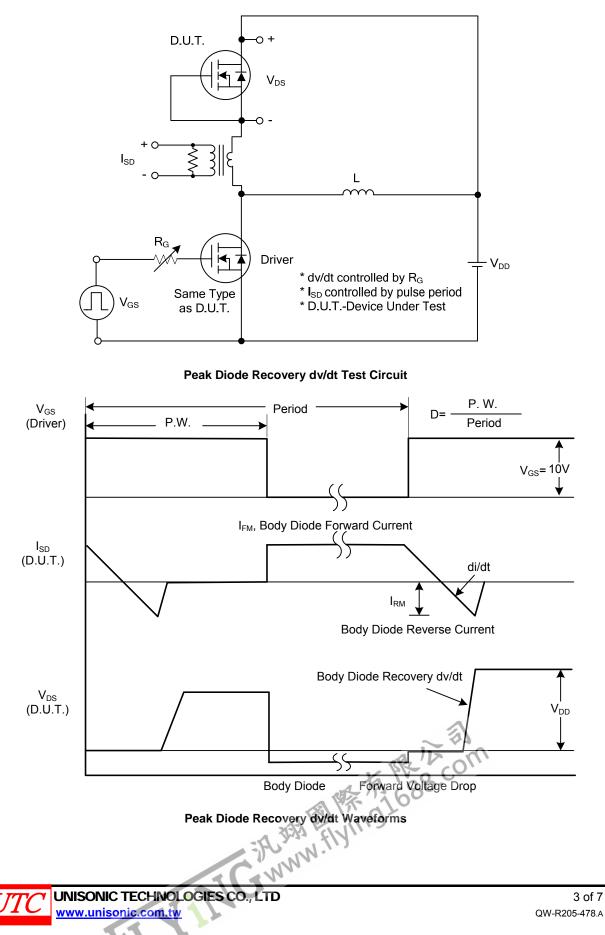
PARAMETER	SYMBOL	RATING	UNIT	
Junction to Ambient	θ」Α	62.5	°C/W	
Junction to Case	θ _{JC}	2.5	°C/W	

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

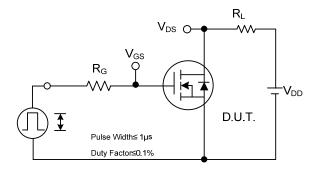
				r		r	
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS					1		
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D = 250µA	700			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =700V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward		V _{GS} =30V, V _{DS} =0V			100	nA
	Reverse	I _{GSS}	V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250µA			4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =5.0A			1.08	Ω
DYNAMIC CHARACTERISTICS							
nput Capacitance		CISS	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		1450		pF
Output Capacitance		C _{OSS}			130		pF
Reverse Transfer Capacitance		C _{RSS}			60		pF
SWITCHING CHARACTERISTIC	S						
Total Gate Charge (Note 1)		Q_{G}	-V _{DS} =300V, V _{GS} =10V, I _D =10A		34		nC
Gateource Charge		Q_{GS}	I _G =3mA (Note 1, 2)		11		nC
Gate-Drain Charge		Q_{GD}			7.6		nC
Turn-on Delay Time (Note 1)		t _{D(ON)}	V _{DS} =300V, V _{GS} =10V, I _D =10A, R _G =25Ω (Note 1, 2)		19		ns
Rise Time		t _R			21		ns
Turn-off Delay Time		t _{D(OFF)}			102		ns
Fall-Time		t _F			30		ns
SOURCE- DRAIN DIODE RATIN	GS AND CH	ARACTERIS	TICS 🔨 🔨				
Maximum Body-Diode Continuous Current		Is	R. V al	0		10	Α
Maximum Body-Diode Pulsed Current		I _{SM}	K PV a CO			20	Α
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	V _{GS} =0V, I _S =10A			1.4	V
Reverse Recovery Time (Note 1)		t _{rr}	V _{GS} =0V, I _S =10A,		390		ns
Reverse Recovery Charge		Qrr	dl _F /dt=100A/µs (Note1)		4.6		μC
Notes: 1 Pulse Test · Pulse width		A 3W1.	. 414			-	

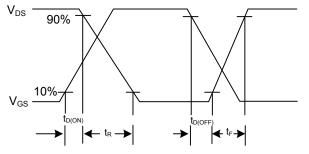
Notes: 1. Pulse Test : Pulse width ≤ 300µs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS



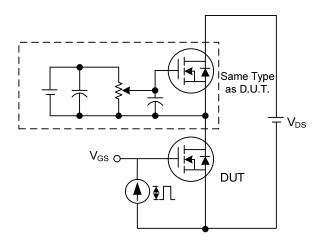
TEST CIRCUITS AND WAVEFORMS



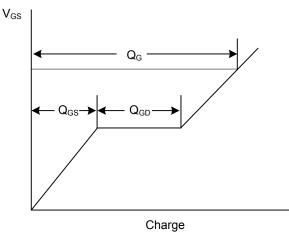


Switching Test Circuit

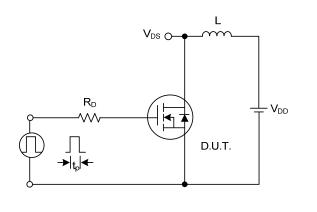




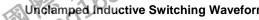
Gate Charge Test Circuit







 $\mathsf{BV}_{\mathsf{DSS}}$ I_{AS} I_{D(t)} V_{DS(t)} V_{DD} Time

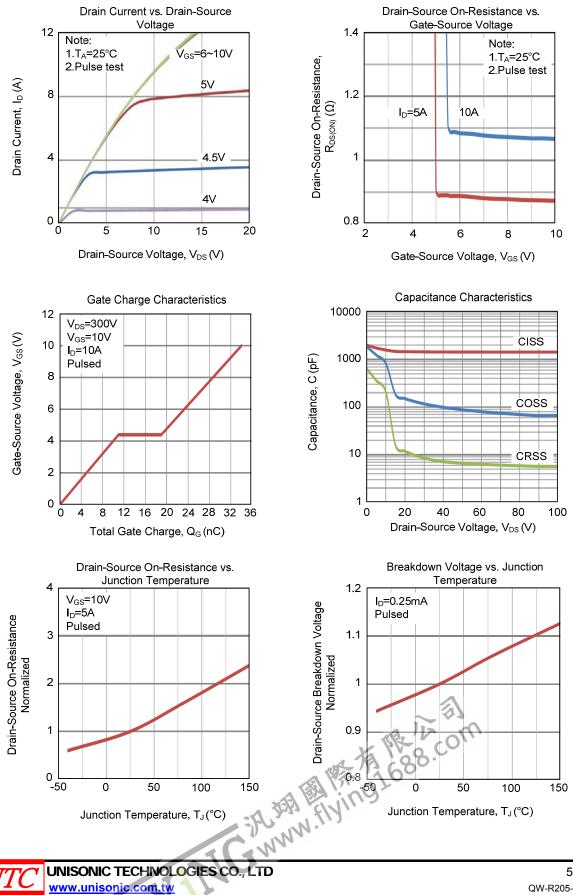


Unclamped Inductive Switching Test Circuit

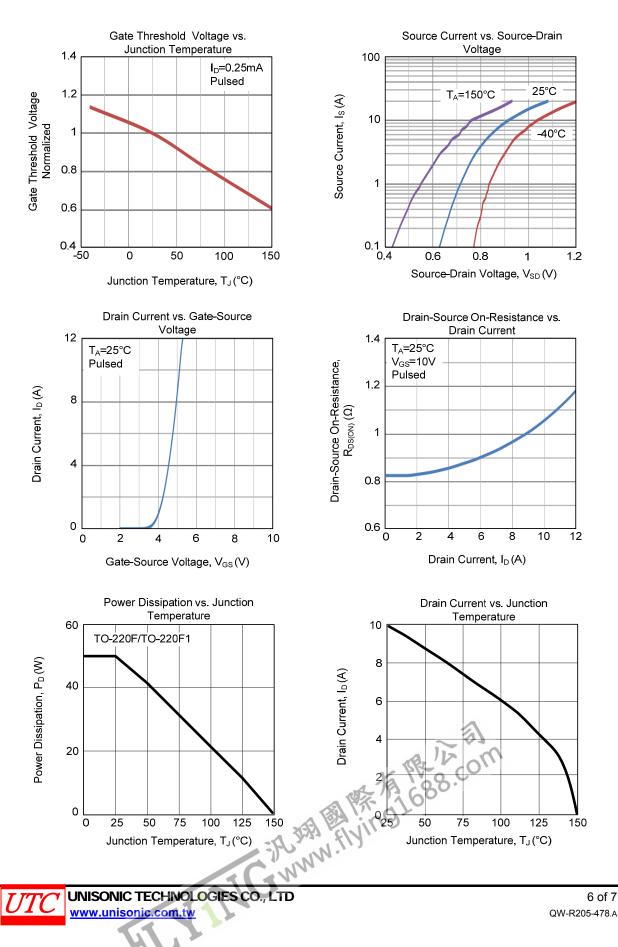
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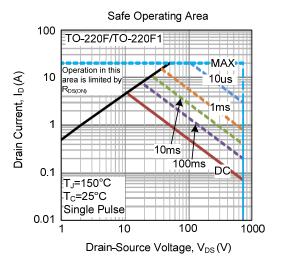
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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