

UNISONIC TECHNOLOGIES CO., LTD

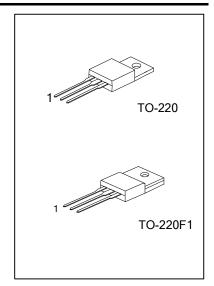
7N40 **Preliminary Power MOSFET**

7 Amps, 400 Volts N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC 7N40 is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

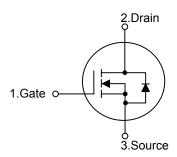
The UTC 7N40 is universally applied in electronic lamp ballast based on half bridge topology and high efficient switched mode power supply.



FEATURES

- * High switching speed
- * 7A, 400V, $R_{DS(ON)}$ =0.8 Ω @ V_{GS} =10V
- * 100% avalanche tested

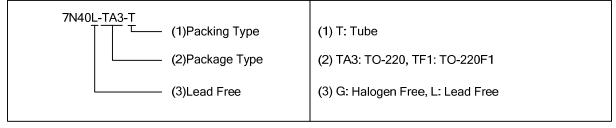
SYMBOL



ORDERING INFORMATION

Ordering Number		Dookogo	Pin Assignment			Dooking	
Lead Free	Halogen Free	Package	1	2	3	Packing	
7N40L-TA3-T	7N40G-TA3-T	TO-220	G	D	S	Tube	
7N40L-TF1-T	7N40G-TF1-T	TO-220F1	G	D	S	Tube	

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



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

PARAMETER			SYMBOL	RATINGS	UNIT		
Drain-Source Voltage			V_{DSS}	400	٧		
Gate-Source Voltage			V_{GSS}	±30	٧		
Drain Current	Continuous (T _C =25°C)		Ι _D	7	Α		
Drain Current	Pulsed (Note 1)		I_{DM}	28	Α		
Avalanche Current (Note	, , ,		I_{AR}	7.0	Α		
Avalenche Energy	Single Pulsed (Note 2)		E _{AS}	360	mJ		
Avaianche Energy	Repetitive (Note 1		E_{AR}	9.8	mJ		
Peak Diode Recovery de	eak Diode Recovery dv/dt (Note 3)		dv/dt	360 mJ 9.8 mJ 4.5 V/ns 98 W 39 W			
Avalanche Current (Note 1) Avalanche Fnerov Single Pulsed (Note 1)	TO-22	20		98	W		
Power Dissipation	TO-22	20F1		39	W		
Danata al-aus 05°0	TO-22	20	P_{D}	0.78	W/°C		
Derate above 25°C	TO-22	20F1	I _D 7 28	W/°C			
Junction Temperature			Τ _J	+150	°C		
Storage Temperature Range			T _{STG}	-55~+150	°C		

Note: 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		
lunction to Ambient	TO-220	0	62.5	°C/W	
Junction to Ambient	TO-220F1	θ_{JA}	62.5	C/VV	
lunction to Coop	TO-220	0	1.28	°C/W	
Junction to Case	TO-220F1	θ_{JC}	3.2	C/VV	

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

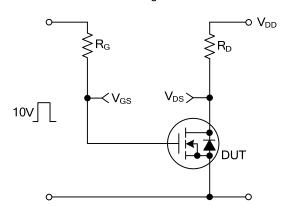
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
OFF CHARACTERISTICS									
Drain-Source Breakdown Voltage		BV_{DSS}	I _D =250μA, V _{GS} =0V	400			V		
Breakdown Voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_{J}$	Reference to 25°C, I _D =250µA		0.43		V/°C		
Drain-Source Leakage Current		I _{DSS}	V _{DS} =400V, V _{GS} =0V			1	μΑ		
Cata Source Lookage Current	Forward	- I _{GSS}	V_{GS} =+30V, V_{DS} =0V			+100	nA		
Gate- Source Leakage Current	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA		
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 Resistance		R _{DS(ON)}	V_{GS} =10V, I_{D} =3.5A		0.62	8.0	Ω		
DYNAMIC PARAMETERS		_							
Input Capacitance	Input Capacitance		V _{GS} =0V, V _{DS} =25V, f=1.0MHz		600	780	pF		
Output Capacitance		C _{ISS}			105	135	pF		
Reverse Transfer Capacitance		C_{RSS}			13	17	pF		
SWITCHING PARAMETERS		_					-		
Total Gate Charge		Q_G	\\ -10\\ \\ -320\\ I -7A		16.5	22	nC		
Gate to Source Charge		Q_GS	V _{GS} =10V, V _{DS} =320V, I _D =7A (Note 4, 5)		4.5		nC		
Gate to Drain Charge		Q_GD	(11016 4, 5)		8.5		nC		
Turn-ON Delay Time		t _{D(ON)}			20	50	ns		
Rise Time		t_R	V_{DD} =200V, I_{D} =7A, R_{G} =25 Ω		75	160	ns		
Turn-OFF Delay Time		$t_{D(OFF)}$	(Note 4, 5)		35	80	ns		
Fall-Time		t_{F}			50	110	ns		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS									
Maximum Body-Diode Continuo	us Current	I _S				7	Α		
Maximum Body-Diode Pulsed Current		I _{SM}				28	Α		
Drain-Source Diode Forward Vo	Drain-Source Diode Forward Voltage		I _S =7A, V _{GS} =0V			1.5	V		
Body Diode Reverse Recovery 1	Γime	t _{RR}	I _S =7A, V _{GS} =0V, dI _F /dt=100A/μs		220		ns		
Body Diode Reverse Recovery Charge		Q_{RR}	(Note 4)		1.3		μC		

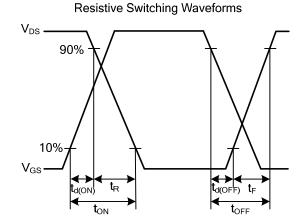
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

- 2. L = 13mH, I_{AS} = 7A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25 $^{\circ}$ C
- 3. $I_{SD} \le 7A$, di/dt $\le 200A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$
- 4. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%
- 5. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

Resistive Switching Test Circuit





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