

UNISONIC TECHNOLOGIES CO., LTD

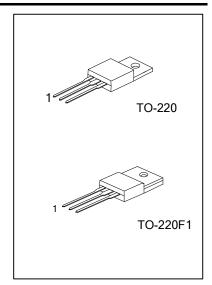
10N40 **Preliminary Power MOSFET**

10.5A, 400V N-CHANNEL **POWER MOSFET**

DESCRIPTION

The UTC 10N40 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.

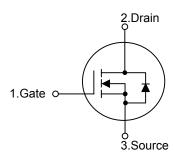
The UTC 10N40 is universally applied in electronic lamp ballast based on half bridge topology and high efficient switched mode power supply.



FEATURES

- * High switching speed
- * $R_{DS(ON)}$ =0.65 Ω @ V_{GS} =10V
- * 100% avalanche tested

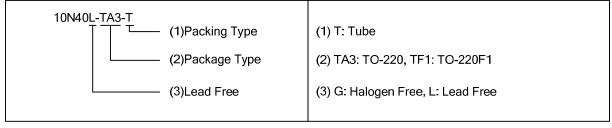
SYMBOL



ORDERING INFORMATION

Ordering Number		Dookogo	Pin	Doolsing		
Lead Free	Halogen Free	Package	1	2	3	Packing
10N40L-TA3-T	140L-TA3-T 10N40G-TA3-T		G	D	S	Tube
10N40L-TF1-T	10N40G-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	
Davis O seed	Continuous (T _C =25°C)	I _D	10.5	Α	
Drain Current	Pulsed (Note 2)	I _{DM}	42	Α	
Avalanche Current (Note 2)		I _{AR}	11	Α	
Avalancha Energy	Single Pulsed (Note 3)	E _{AS}	360	mJ	
Avalanche Energy	Repetitive (Note 4)	E_{AR}	13.5	mJ	
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns	
TO-220			135	W	
Power Dissipation	TO-220F1	ь [44	W	
TO-220		P _D	1.07	W/°C	
Derate above 25°C	TO-220F1		0.35	W/°C	
Junction Temperatur	re .	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 = 5.7mH, I_{AS} = 10.5A, V_{DD} = 50V, R_{G} = 25 Ω , Starting T_{J} = 25 $^{\circ}$ C
- 4. $I_{SD} \le 10.5 A$, di/dt $\le 200 A/\mu s$, $V_{DD} \le BV_{DSS}$, Starting $T_J = 25^{\circ}C$

■ THERMAL DATA

PARAME	TER	SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	°C/W
lunction to Coop	Case TO-220 TO-220F1	θ _{JC}	0.93	°C/\\/
Junction to Case			2.86	°C/W

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

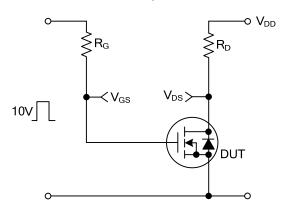
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	400			V		
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_{J}$	Reference to 25°C, I _D =250µA		0.54		V/°C		
Drain-Source Leakage Current	I _{DSS}	V _{DS} =400V, V _{GS} =0V			1	μA		
Coto Source Lookers 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	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_{D}=250\mu A$			4.0	V		
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5.25A		0.5	0.65	Ω		
DYNAMIC PARAMETERS								
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		840	1090	pF		
Output Capacitance	Coss			250	325	pF		
Reverse Transfer Capacitance	C_{RSS}			80	110	pF		
SWITCHING PARAMETERS	_		-	-				
Total Gate Charge	Q_G	\/ =10\/ \/ =220\/ =10.5A		28	35	nC		
Gate to Source Charge	Q_GS	V _{GS} =10V, V _{DS} =320V, I _D =10.5A (Note 1, 2)		4		nC		
Gate to Drain Charge	Q_GD	(Note 1, 2)		15		nC		
Turn-ON Delay Time	t _{D(ON)}	V_{DD} =200V, I_{D} =10.5A, R_{G} =25 Ω (Note 1, 2)		14	40	ns		
Rise Time	t_R			89	190	ns		
Turn-OFF Delay Time	$t_{D(OFF)}$			81	170	ns		
Fall-Time	t _F			81	170	ns		
SOURCE- DRAIN DIODE RATINGS AND CI	HARACTERIST	TICS						
Maximum Body-Diode Continuous Current	Is				10.5	Α		
Maximum Body-Diode Pulsed Current	I _{SM}				42	Α		
Drain-Source Diode Forward Voltage	V_{SD}	I _S =10.5A, V _{GS} =0V			1.4	V		
Body Diode Reverse Recovery Time	t _{rr}	I _S =10.5A, V _{GS} =0V,		290		ns		
Body Diode Reverse Recovery Charge	Q _{RR}	dI _F /dt=100A/μs (Note 1)		2.4		μC		

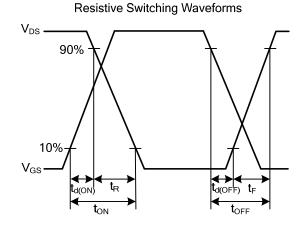
Notes: 1. Pulse Test: Pulse width ≤ 300µs, Duty cycle ≤ 2%

^{2.} Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

Resistive Switching Test Circuit





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