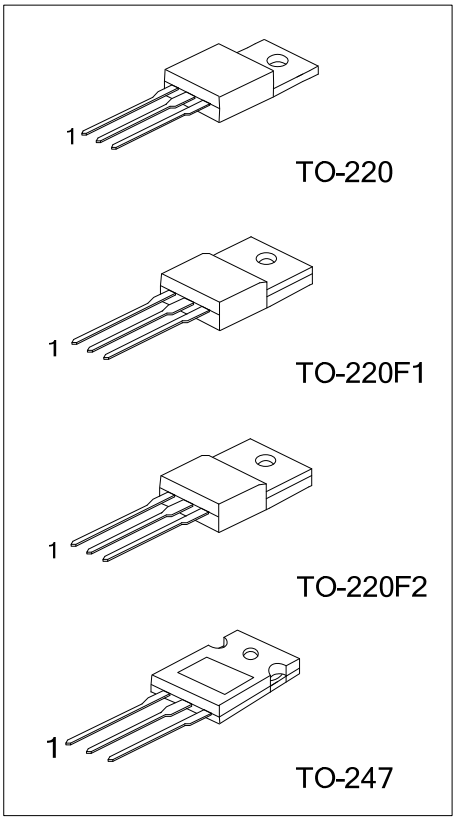
18N40

Power MOSFET

18A, 400V N-CHANNEL POWER MOSFET



■ DESCRIPTION

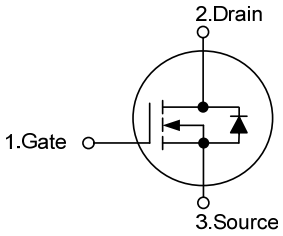
The UTC **18N40** is a 400V N-channel power MOSFET, providing customers with perfect $R_{DS(ON)}$, low gate charge and operation with low gate voltages.

The UTC **18N40** is generally used as a load switch or applied in PWM applications.

■ FEATURES

* $R_{DS(ON)} \leq 0.24\Omega$ @V_{GS} = 10V
* Fast Switching Speed
* Avalanche Energy Specified

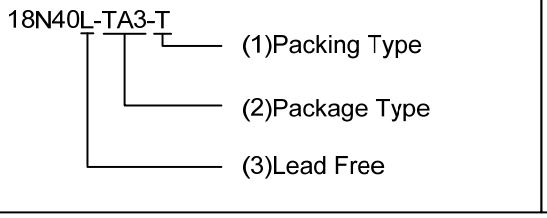
■ SYMBOL



■ ORDERING INFORMATION

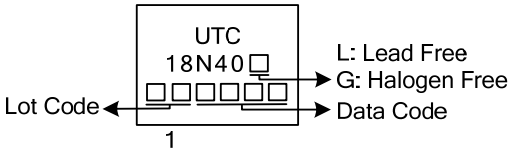
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
18N40L-TA3-T	18N40G-TA3-T	TO-220	G	D	S	Tube
18N40L-TF1-T	18N40G-TF1-T	TO-220F1	G	D	S	Tube
18N40L-TF2-T	18N40G-TF2-T	TO-220F2	G	D	S	Tube
18N40L-T47-T	18N40G-T47-T	TO-247	G	D	S	Tube

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



(1) T: Tube
(2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2, T47: TO-247
(3) L: Lead Free, G: Halogen Free

■ MARKING INFORMATION

PACKAGE	MARKING
TO-220 TO-220F1 TO-220F2 TO-247	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	400	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	Continuous	I_D	18	A
	Pulsed	I_{DM}	72	A
Avalanche Current		I_{AR}	18	A
Avalanche Energy	Single Pulsed	E_{AS}	1000	mJ
	Repetitive	E_{AR}	30	mJ
Peak Diode Recovery dv/dt		dv/dt	10	V/ns
Power Dissipation	TO-220	P_D	235	W
	TO-220F1		38.5	
	TO-220F2		40.5	
	TO-247		360	
Junction Temperature		T_J	150	°C
Storage Temperature		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
Junction to Case	TO-220	θ_{JC}	0.53	°C/W
	TO-220F1		3.3	
	TO-220F2		3.0	
	TO-247		0.35	

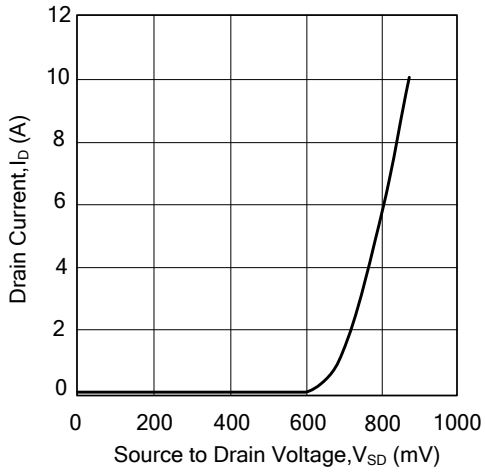
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	400			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=400V, V_{GS}=0V			25	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=9A		0.18	0.24	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		2500		pF
Output Capacitance	C_{OSS}			280		pF
Reverse Transfer Capacitance	C_{RSS}			23		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=0.5V_{DSS}, I_D=18A, R_G=5Ω (Note 1, 2)		50		nC
Gate Source Charge	Q_{GS}			15		nC
Gate Drain Charge	Q_{GD}			18		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V, V_{DS}=0.5V_{DSS}, I_D=9A (Note 1, 2)		21		ns
Turn-ON Rise Time	t_R			22		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			62		ns
Turn-OFF Fall-Time	t_F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_F=I_S ,V_{GS}=0V			1.5	V
Maximum Continuous Drain-Source Diode Forward Current	I_S	V_{GS}=0V			18	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	Repetitive			72	A
Reverse Recovery Time	t_{rr}	V_{GS}=0V, dI_F/dt=100A/μs, I_S=18A, V_R=100V (Note 1)			200	ns
Reverse Recovery Charge	Q_{RR}			0.8		μC

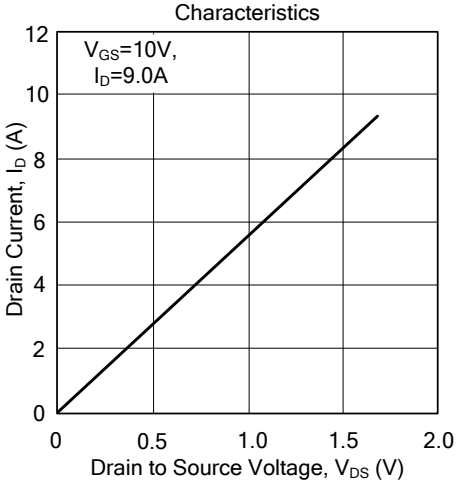
Notes: 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. Essentially independent of operating temperature

■ TYPICAL CHARACTERISTICS

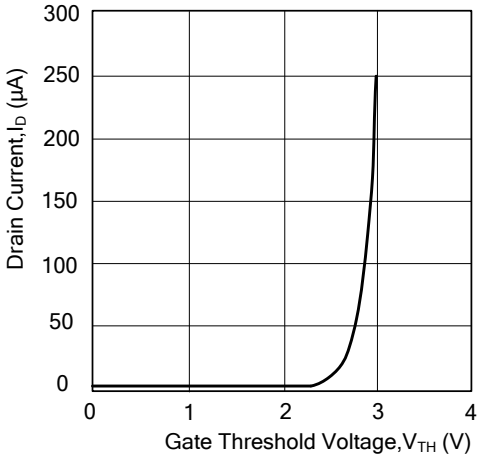
Drain Current vs. Source to Drain Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Gate Threshold Voltage



Drain Current vs. Drain-Source Breakdown Voltage