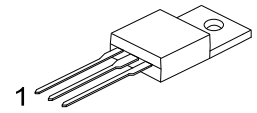
N-CHANNEL ENHANCEMENT MODE



TO-220

■ DESCRIPTION

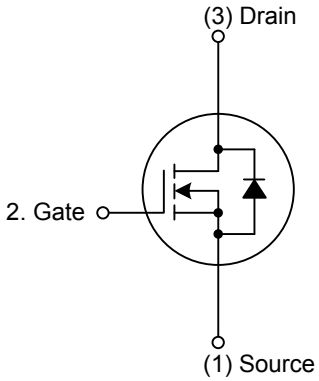
The UTC **UP9972** is an N-ch enhancement mode Power MOS Field Effect Transistor using advanced technology to provide fast speed switching, low on-resistance and perfect cost-effectiveness.

The UTC **UP9972** is ideal for commercial-industrial surface mount applications applied to DC/DC converters or other low voltage applications.

■ FEATURES

* Single drive required
* Fast switching capability
* Ultra low gate charge
* Halogen Free

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UP9972L-TA3-T	UP9972G-TA3-T	TO-220	G	D	S	Tube

UP9972L-TA3-T

(1)Packing Type

(2)Package Type

(3) Lead Plating

(1) T: Tube

(2) TA3: TO-220

(3) G: Halogen Free, L: Lead Free

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±25	V
Continuous Drain Current (V_{GS} =10V, T_C=25°C)	I_D	60	A
Pulsed Drain Current (Note 2)	I_{DM}	230	A
Avalanche Current (Note 3)	I_{AR}	30	A
Single Pulse Avalanche Energy (Note 3)	E_{AS}	45	mJ
Power Dissipation (T_C=25°C)	P_D	89	W
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. Pulse width limited by $T_{J(MAX)}$
3. L = 100μH, V_{DD} =30V, I_{AS}=30A, R_G =25Ω, Starting T_J =25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to ambient	θ_{JA}	62	°C/W
Junction to case	θ_{JC}	1.4	°C/W

■ 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	60			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Reference to 25°C, I_D=1mA		0.06		V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±25V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1		3	V
Drain to Source On-state Resistance (Note)	$R_{DS(ON)}$	V_{GS}=10V, I_D=35A			18	mΩ
		V_{GS}=4.5V, I_D=25A			22	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=25V, f=1.0MHz		3170	5070	pF
Output Capacitance	C_{OSS}			280		pF
Reverse Transfer Capacitance	C_{RSS}			230		pF
Gate Resistance	R_G	f=1.0MHz		1.7		Ω
SWITCHING PARAMETERS						
Turn-ON Delay Time (Note)	$t_{D(ON)}$	V_{DS}=30V, V_{GS}=10V , I_D=35A R_G=3.3Ω, R_D=0.86Ω		11		ns
Turn-ON Rise Time	t_R			58		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			45		ns
Turn-OFF Fall-Time	t_F			80		ns
Total Gate Charge (Note)	Q_G	I_D=35A, V_{DS}=48V, V_{GS}=4.5V		32	51	nC
Gate Source Charge	Q_{GS}			8		nC
Gate Drain Charge	Q_{GD}			20		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note)	V_{SD}	I_S=35A, V_{GS}=0V			1.2	V
Reverse Recovery Time (Note)	t_{RR}	I_S=35A, V_{GS}=0V		50		ns
Reverse Recovery Charge	Q_{RR}	dI/dt=100A/μs		48		nC

Note: Pulse test