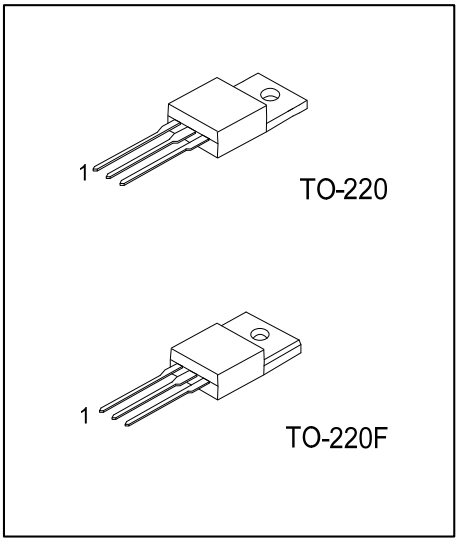
9A, 700V N-CHANNEL POWER MOSFET



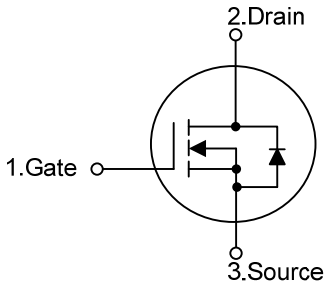
■ DESCRIPTION

The **UTC 9N70** is a high voltage and high current power MOSFET designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and a high rugged avalanche characteristics. This power MOSFET is usually used at DC-DC, AC-DC converters for power applications.

■ FEATURES

* $R_{DS(ON)}$ <1.3Ω@V_{GS} =10V
* Low gate charge (typical 44 nC)
* Low Crss (typical 10 pF)
* High switching Speed
* 100% avalanche tested
* Improved dv/dt capability

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
9N70L-TA3-T	9N70G-TA3-T	TO-220	G	D	S	Tube
9N70L-TF3-T	9N70G-TF3-T	TO-220F	G	D	S	Tube

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

9N70L-TA3-T

(1)Packing Type — (1) T: Tube

(2)Package Type — (2) TA3: TO-220, TF3: TO-220F

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

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	700	V
Gate-Source Voltage			V_{GSS}	±30	V
Drain Current	Continuous V_{GS} @ 10V	T_C=25°C	I_D	9	A
		T_C=100°C		5	A
	Pulsed (Note 2)		I_{DM}	40	A
Avalanche Current			I_{AR}	9	A
Avalanche Energy	Single Pulsed (Note 3)		E_{AS}	305	mJ
	Repetitive		E_{AR}	9	mJ
Power Dissipation (T_C=25°C)		TO-220	P_D	156	W
		TO-220F		44	
Linear Derating Factor				1.25	W/°C
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 safe operating area.
3. Starting T_J=25°C, V_{DD}=50V, L=6.8mH, R_G=25Ω, I_{AS}=9A.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambien	TO-220	θ_{JA}	62	°C/W
	TO-220F		62.5	
Junction to Case	TO-220	θ_{JC}	0.8	°C/W
	TO-220F		2.86	

■ 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}	I_D=1mA, V_{GS}=0V	700			V
Breakdown Voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA		0.6		V/°C
Drain-Source Leakage Current		I_{DSS}	V_{DS}=700V, V_{GS}=0V, T_J=25°C			10	μA
			V_{DS}=560V, V_{GS}=0V, T_J=125°C			100	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V			+100	nA
	Reverse		V_{GS}=-30V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2		4	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=4.5A		1.1	1.25	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		1500		pF
Output Capacitance		C_{OSS}			130		pF
Reverse Transfer Capacitance		C_{RSS}			10		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 2)		Q_G	V_{GS}=10V, V_{DS}=560V, I_D=9A		44		nC
Gate to Source Charge		Q_{GS}			11		nC
Gate to Drain Charge		Q_{GD}			12		nC
Turn-ON Delay Time (Note 2)		$t_{D(ON)}$	V_{DD}=350V, I_D=9A, R_G=10Ω, V_{GS}=10V, R_D=38 Ω		19		ns
Rise Time		t_R			21		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			56		ns
Fall-Time		t_F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S	V_D=V_G=0V, V_S=1.5V			9	A
Maximum Body-Diode Pulsed Current (Note 1)		I_{SM}				40	A
Drain-Source Diode Forward Voltage (Note 2)		V_{SD}	I_S=9A, V_{GS}=0V, T_J = 25°C			1.5	V

Notes: 1. Pulse width limited by safe operating area.
2. Pulse width≤300μs, duty cycle≤2%.