

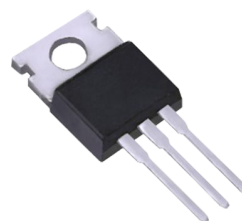
9A, 700V N-CHANNEL POWER MOSFET

■ 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

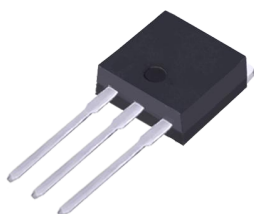
- * $R_{DS(ON)} < 1.3\Omega @ V_{GS} = 10V$
- * Low gate charge (typical 44 nC)
- * Low Crss (typical 10 pF)
- * High switching Speed
- * 100% avalanche tested
- * Improved dv/dt capability



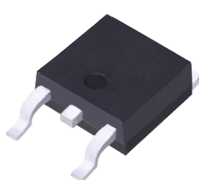
TO-220



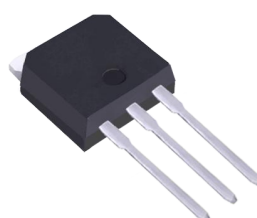
TO-220F



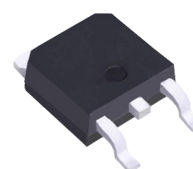
TO-262



TO-263



TO-251



TO-252

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	700	V
Gate-Source Voltage			V_{GSS}	± 30	V
Drain Current	Continuous	$T_C=25^\circ\text{C}$	I_D	9	A
	$V_{GS} @ 10\text{V}$	$T_C=100^\circ\text{C}$		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 ($T_C=25^\circ\text{C}$)	TO-220		P_D	156	W
	TO-220F			44	
Linear Derating Factor				1.25	W/ $^\circ\text{C}$
Junction Temperature			T_J	+150	$^\circ\text{C}$
Storage Temperature			T_{STG}	-55~+150	$^\circ\text{C}$

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 $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $L=6.8\text{mH}$, $R_G=25\Omega$, $I_{AS}=9\text{A}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62	$^\circ\text{C/W}$
	TO-220F		62.5	
Junction to Case	TO-220	θ_{JC}	0.8	$^\circ\text{C/W}$
	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		ΔBV _{DSS} /ΔT _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%.