

11N90

Power MOSFET

11A, 900V N-CHANNEL POWER MOSFET

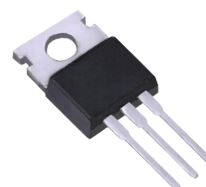
■ DESCRIPTION

The UTC **11N90** is a N-channel enhancement mode Power FET 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 **11N90** is universally applied in high efficiency switch mode power supply,

■ FEATURES

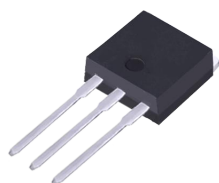
- * $R_{DS(on)} < 1.1\Omega @ V_{GS} = 10V, I_D = 5.5A$
- * High switching speed
- * Improved dv/dt capability
- * 100% avalanche tested



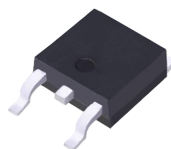
TO-220



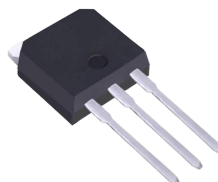
TO-220F



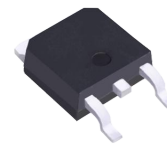
TO-262



TO-263



TO-251



TO-252

■ ABSOLUTE MAXIMUM RATINGS($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	900	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	11	A
	Pulsed (Note 1)	I_{DM}	44	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	1000	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.0	V/ns
Power Dissipation	TO-220	P_D	160	W
	TO-220F1/TO-220F2		50	W
	TO-3P/TO-3PN		215	W
	TO-247		190	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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 CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F1 TO-220F2	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-3P/TO-3PN		40	$^\circ\text{C/W}$
	TO-247		50	$^\circ\text{C/W}$
	TO-220		0.78	$^\circ\text{C/W}$
Junction to Case	TO-220F1/TO-220F2	θ_{JC}	2.48	$^\circ\text{C/W}$
	TO-3P/TO-3PN		0.58	$^\circ\text{C/W}$
	TO-247		0.65	$^\circ\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	900			V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu\text{A}$, Referenced to 25°C		1.0		$^\circ\text{C}$
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=900\text{V}$, $V_{GS}=0\text{V}$			10	μA
			$V_{DS}=720\text{V}$, $T_C=125^\circ\text{C}$			100	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=+30\text{V}$, $V_{DS}=0\text{V}$			100	nA
	Reverse		$V_{GS}=-30\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	3.0		5.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=5.5\text{A}$		0.91	1.1	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		980	1380	pF
Output Capacitance		C_{OSS}			170	280	
Reverse Transfer Capacitance		C_{RSS}			18	25	
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=1.3\text{A}$ (Note 4, 5)		60	80	nC
Gate to Source Charge		Q_{GS}			14		
Gate to Drain Charge		Q_{GD}			22		
Turn-ON Delay Time		$t_{D(ON)}$	$V_{DD}=30\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ (Note 4, 5)		125	140	ns
Rise Time		t_R			260	320	
Turn-OFF Delay Time		$t_{D(OFF)}$			340	380	
Fall-Time		t_F			220	270	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				11	A
Maximum Body-Diode Pulsed Current (Note1)		I_{SM}				44	A
Drain-Source Diode Forward Voltage (Note 4)		V_{SD}	$I_S=11\text{A}$, $V_{GS}=0\text{V}$			1.4	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. $L = 15\text{mH}$, $I_{AS} = 11\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

3. $I_{SD} \leq 11.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

4. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

5. Essentially independent of operating temperature

TYPICAL CHARACTERISTICS

