

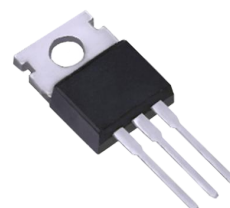
9A, 950V N-CHANNEL POWER MOSFET

■ DESCRIPTION

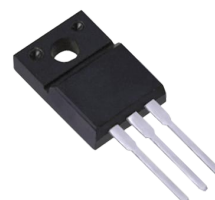
The UTC **9N95** uses UTC's advanced proprietary, planar stripe, DMOS technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

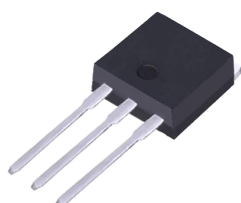
- * $R_{DS(ON)} \leq 1.4\Omega$ @ $V_{GS}=10V$, $I_D=4.5A$
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness



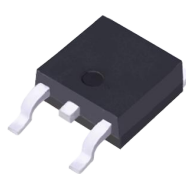
TO-220



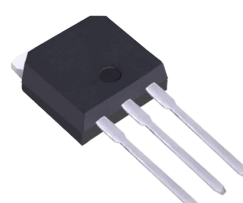
TO-220F



TO-262



TO-263



TO-251



TO-252

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	950	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$)		I_D	9.0	A
Pulsed Drain Current (Note 2)		I_{DM}	36	A
Avalanche Current (Note 2)		I_{AR}	9.0	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	900	mJ
	Repetitive (Note 2)	E_{AR}	28	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.0	V/ns
Power Dissipation		P_D	160	W
Linear Derating Factor above $T_C = 25^\circ\text{C}$			1.28	$W/^\circ\text{C}$
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. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. $L = 21\text{mH}$, $I_{AS} = 9.0\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 9.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	50	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.78	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	950			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 950\text{ V}, V_{GS} = 0\text{ V}$			10	μA
Gate-Body Leakage Current	Forward	$I_{GSSF}, V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$			100	nA
	Reverse	$I_{GSSR}, V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$			-100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D = 250\mu\text{A}$, Referenced to 25°C		0.99		$\text{V}/^\circ\text{C}$
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-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 4.5\text{A}$		1.05	1.4	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		2100	2730	pF
Output Capacitance	C_{OSS}			175	230	pF
Reverse Transfer Capacitance	C_{RSS}			14	18	pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q_G	$V_{DS} = 760\text{V}, I_D = 11.0\text{A},$ $V_{GS} = 10\text{ V (Note 1,2)}$		45	58	nC
Gate-Source Charge	Q_{GS}			13		nC
Gate-Drain Charge	Q_{GD}			18		nC
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 475\text{V}, I_D = 11.0\text{ A},$ $R_G = 25\Omega$ (Note 1, 2)		50	110	ns
Turn-On Rise Time	t_R			120	250	ns
Turn-Off Delay Time	$t_{D(OFF)}$			100	210	ns
Turn-Off Fall Time	t_F			75	160	ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				9.0	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				36	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 9.0\text{ A}$			1.4	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0\text{ V}, I_S = 9.0\text{ A},$ $dI_F / dt = 100\text{ A}/\mu\text{s}$ (Note 1)		550		ns
Reverse Recovery Charge	Q_{rr}				6.5	

Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TYPICAL CHARACTERISTICS

