

33A, 250V N-CHANNEL POWER MOSFET

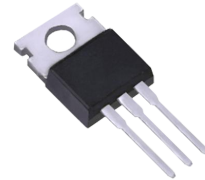
■ DESCRIPTION

The UTC **33N25** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance, low gate charge and high switching speed.

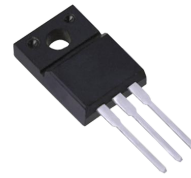
The UTC **33N25** is suitable for high voltage synchronous rectifier and DC/DC converters, etc.

■ FEATURES

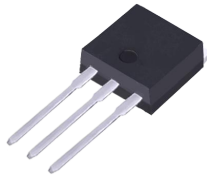
- * $R_{DS(ON)} < 80 \text{ m}\Omega$ @ $V_{GS}=10\text{V}, I_D=33\text{A}$
- * $R_{DS(ON)} < 80 \text{ m}\Omega$ @ $V_{GS}=6.0\text{V}, I_D=15\text{A}$
- * Low Gate Charge (Typical 18.5nC)
- * High Switching Speed



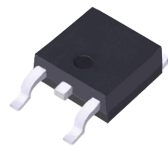
TO-220



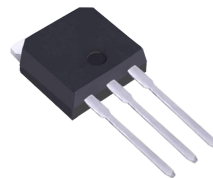
TO-220F



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}	250	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous ($V_{GS}=10\text{V}$) $T_C=25^\circ\text{C}$	I_D	33	A
	Pulsed	I_{DM}	132	A
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	918	mJ
Power Dissipation		P_D	235	W
Derate above 25°C			1.89	mW/ $^\circ\text{C}$
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. Starting $T_J = 25^\circ\text{C}$, $L = 1.35\text{mH}$, $I_{AS} = 33\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.53	$^\circ\text{C}/\text{W}$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	250			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=250\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate- Source Leakage Current	I_{GSS}	Forward $V_{GS}=+20\text{V}$, $V_{DS}=0\text{V}$			+100	nA
		Reverse $V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=33\text{A}$			80	m Ω
		$V_{GS}=6.0\text{V}$, $I_D=15\text{A}$			80	m Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		1250		pF
Output Capacitance	C_{OSS}			190		pF
Reverse Transfer Capacitance	C_{RSS}			45		pF
SWITCHING PARAMETERS						
Total Gate Charge at 10V	Q_G	$V_{GS}=10\text{V}$, $V_{DD}=50\text{V}$, $I_D=33\text{A}$, $I_G=1.0\text{mA}$		18.5	28	nC
Gate to Source Charge	Q_{GS}			6.5		nC
Gate to Drain Charge	Q_{GD}			4.6		nC
Turn-ON Time	t_{ON}	$V_{DD}=50\text{V}$, $I_D=33\text{A}$, $V_{GS}=10\text{V}$, $R_{GS}=16\Omega$		35	80	ns
Turn-ON Delay Time	$t_{D(ON)}$			230		ns
Rise Time	t_R			75		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			120		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_{SD}=33\text{A}$			1.4	V

- Notes: 1. Pulse width limited by safe operating area.
 2. Pulsed: Pulse duration=300 μs , Duty cycle $\leq 2\%$.