



UT12N10

Preliminary

Power MOSFET

12 Amps, 100 Volts N-CHANNEL POWER MOSFET

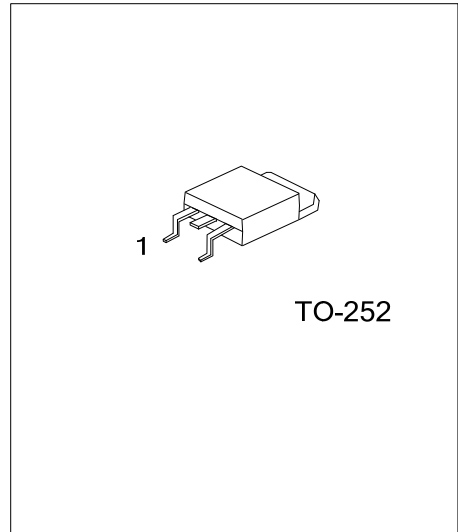
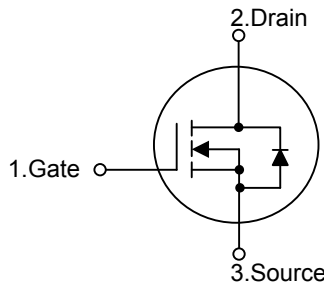
DESCRIPTION

The UTC **UT12N10** is an N-channel mode Power FET using UTC's advanced technology to provide customers with minimum on-state resistance by extremely high dense cell design. Moreover, it's good at handling high power and current.

FEATURES

- * 100V, 12A, $R_{DS(ON)} = 180m\Omega @ V_{GS} = 10V$.
- * Be good at handling high power and current.
- * Very high dense cell design for super low $R_{DS(ON)}$.
- * Lead free product is acquired.

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT12N10L-TN3-R	UT12N10G-TN3-R	TO-252	G	D	S	Tape Reel

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

<p>UT12N10L-TN3-R</p>	<p>(1) R: Tape Reel</p> <p>(2) TN3: TO-252</p> <p>(3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_D	12	A
	Pulsed (Note 1)	I_{DM}	44	A
Power Dissipation		P_D	43	W/ $^{\circ}\text{C}$
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.

Note:1 Repetitive Rating: Pulse width limited by maximum junction temperature

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient (Note 2)	θ_{JA}	50	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	3.5	$^{\circ}\text{C}/\text{W}$

Note: θ_{JA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.

θ_{JC} is guaranteed by design while θ_{JA} is determined by the user's board design.

Note:2 When mounted on a 1 in² pad of 2 oz copper

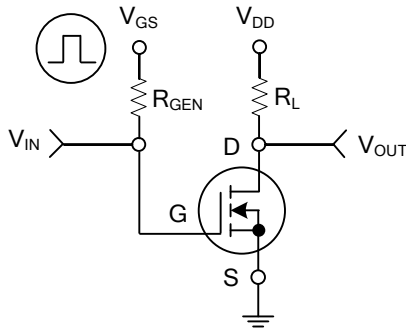
■ ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	100			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate- Source Leakage Current	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 (Note 1)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2		4	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=6\text{A}$		150	180	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=6\text{A}$		5		S
DYNAMIC PARAMETERS (Note 2)						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		430		pF
Output Capacitance	C_{OSS}			90		pF
Reverse Transfer Capacitance	C_{RSS}			20		pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=80\text{V}$, $I_D=12\text{A}$		8	16	nC
Gate to Source Charge	Q_{GS}			1.5		nC
Gate to Drain Charge	Q_{GD}			2		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=80\text{V}$, $I_D=12\text{A}$, $V_{GS}=10\text{V}$, $R_G=9.1\Omega$		12	24	ns
Rise Time	t_R			7	14	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			18	35	ns
Fall-Time	t_F			3	6	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				12	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=12\text{A}$, $V_{GS}=0\text{V}$			1.2	V

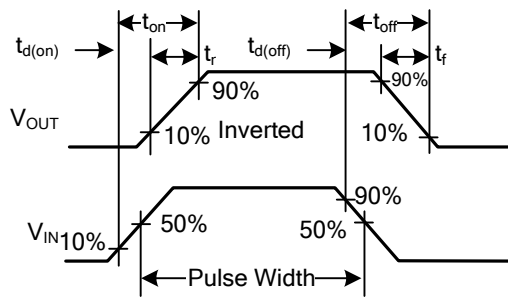
Note: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Guaranteed by design, not subject to production testing.

■ TEST CIRCUITS AND WAVEFORMS



Switching Test Circuit



Switching Waveforms

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