

4N100

Power MOSFET

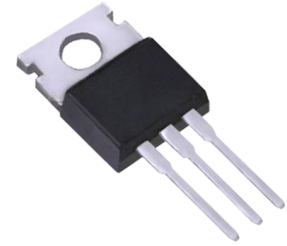
4A, 1000V N-CHANNEL POWER MOSFET

■ DESCRIPTION

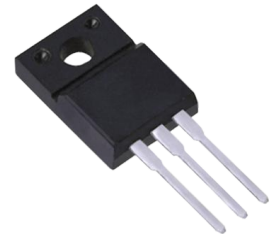
The UTC **4N100** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and high breakdown voltage.

■ FEATURES

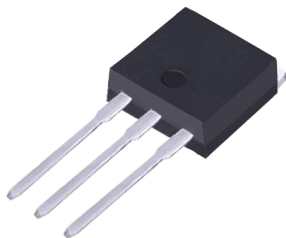
- * $R_{DS(ON)} \leq 3.5 \Omega$ @ $V_{GS}=10V$, $I_D=2.0A$
- * High switching speed
- * High breakdown voltage



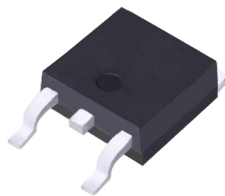
TO-220



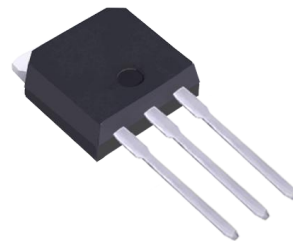
TO-220F



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}	1000	V
Drain-Gate Voltage ($R_{GS}=2k\Omega$)		V_{DGR}	1000	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	4	A
	Pulsed	I_{DM}	8	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	88.2	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.84	V/ns
Power Dissipation	TO-220	P_D	140	W
	TO-220F/TO-220F1		38	W
	TO-220F2		40	W
	TO-251/TO-252		58	W
Junction Temperature		T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range		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. $L=10\text{mH}$, $I_{AS}=4.2\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 4.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-220F1/TO-220F2			
	TO-251/TO-252			
Junction to Case	TO-220	θ_{JC}	0.89	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1		3.25	
	TO-220F2		3.1	
	TO-251/TO-252		2.15 (Note)	

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

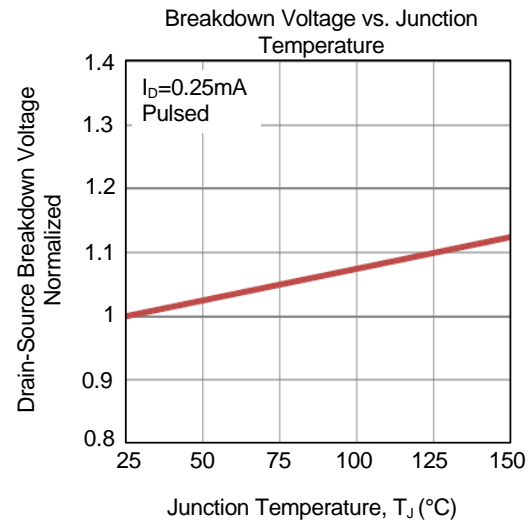
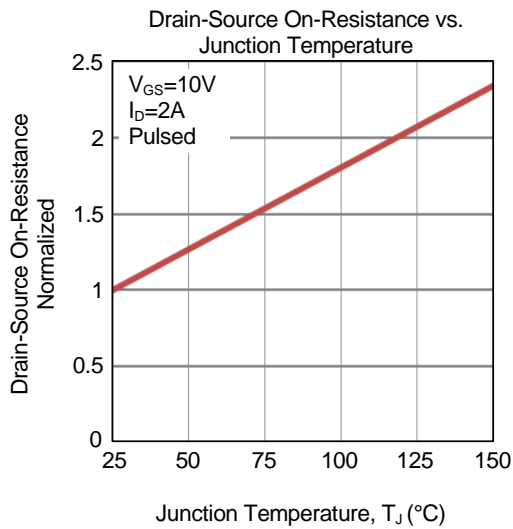
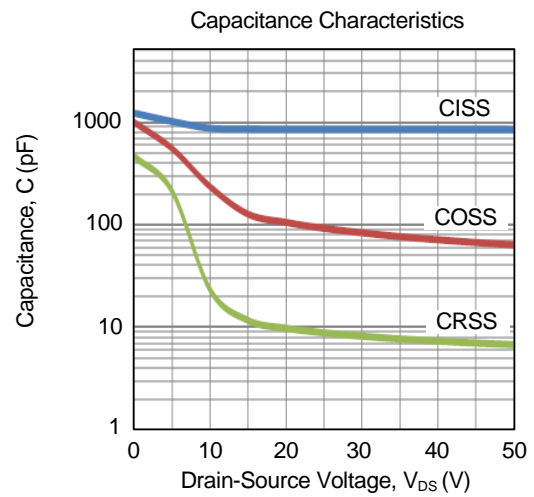
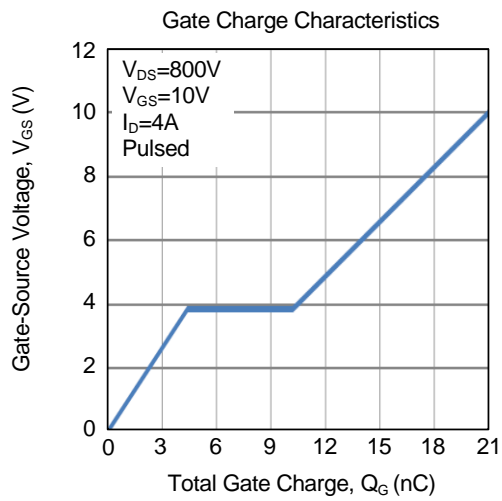
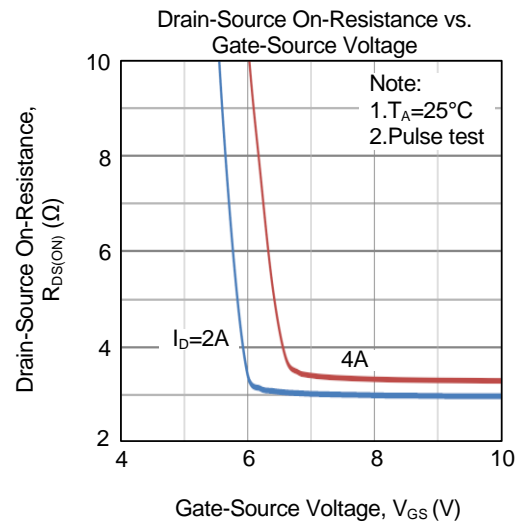
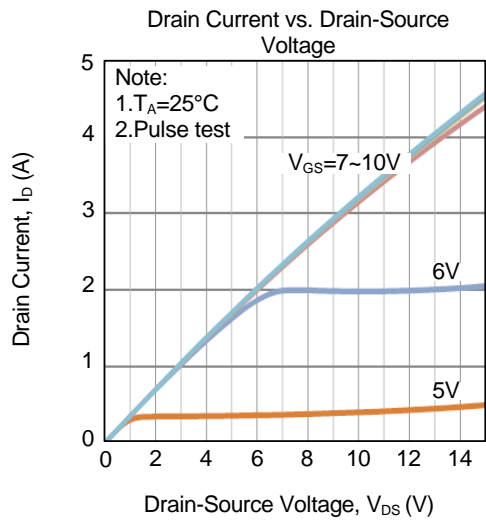
ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=0.25\text{mA}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$	1000			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=1000\text{V}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$			10	μA
		$V_{DS}=1000\text{V}$, $V_{GS}=0\text{V}$, $T_C=125^\circ\text{C}$			100	μA
Gate-Source Leakage Current	Forward	I_{GSS}			+100	nA
	Reverse					
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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=2.0\text{A}$			3.5	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		849		pF
Output Capacitance	C_{OSS}			91		pF
Reverse Transfer Capacitance	C_{RSS}			8.7		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=800\text{V}$, $V_{GS}=10\text{V}$, $I_D=4.0\text{A}$ $I_G=1\text{mA}$ (Note 1, 2)		21		nC
Gate-Source Charge	Q_{GS}			4.4		nC
Gate-Drain Charge	Q_{GD}			5.8		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=100\text{V}$, $V_{GS}=10\text{V}$, $I_D=4.0\text{A}$, $R_{GS}=25\Omega$		18		ns
Rise Time	t_R			20		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			100		ns
Fall-Time	t_F			45		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S	$T_C=25^\circ\text{C}$			4	A
Maximum Body-Diode Pulsed Current	I_{SM}	$T_C=25^\circ\text{C}$			8	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_F=4.0\text{A}$, $V_{GS}=0\text{V}$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=4.0\text{A}$, $V_{GS}=0\text{V}$, $di/dt=100\text{A}/\mu\text{s}$		880		ns
Reverse Recovery Charge	Q_{rr}			5.08		μC

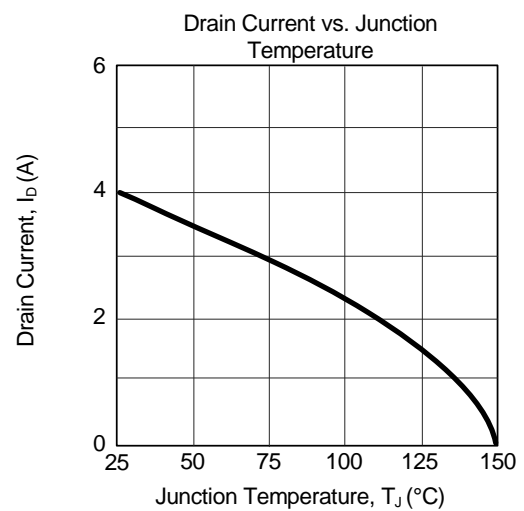
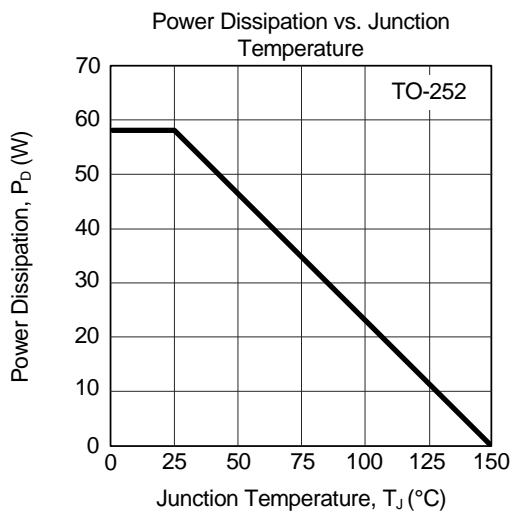
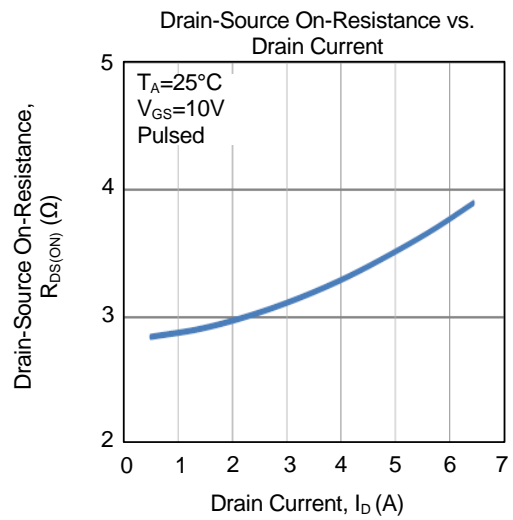
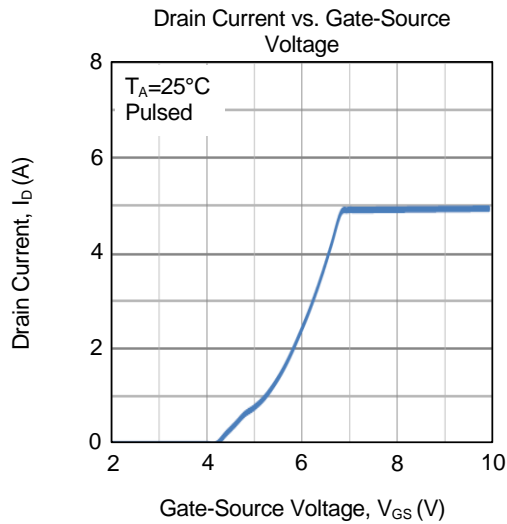
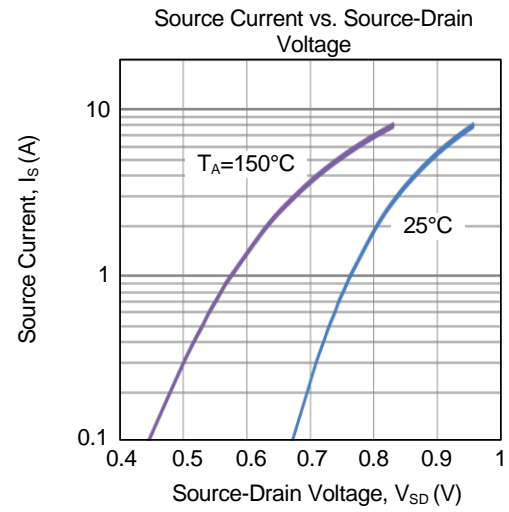
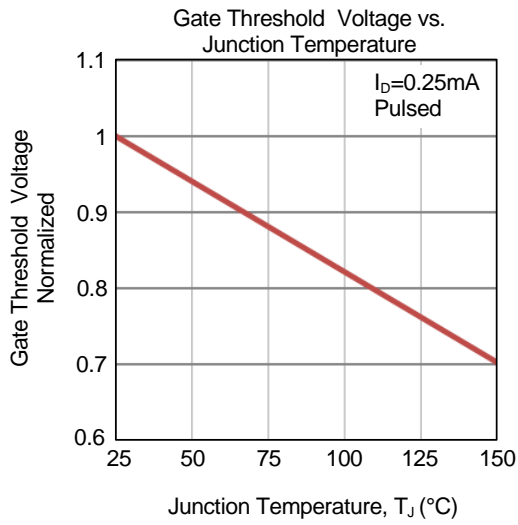
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)

