

8N80

Power MOSFET

8A, 800V N-CHANNEL POWER MOSFET

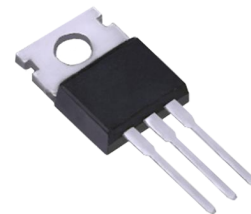
■ DESCRIPTION

The UTC **8N80** is a N-channel mode power MOSFET, it uses UTC's advanced technology to provide customers planar stripe and DMOS technology. This technology allows a minimum on-state resistance, superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

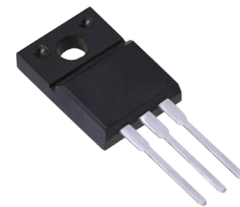
The UTC **8N80** is generally applied in high efficiency switch mode power supplies.

■ FEATURES

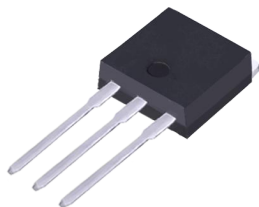
- * $R_{DS(ON)} \leq 1.45\Omega @ V_{GS}=10V, I_D=4.0A$
- * Improved dv/dt Capability
- * Fast Switching Speed
- * 100% Avalanche Tested
- * RoHS-Compliant Product



TO-220



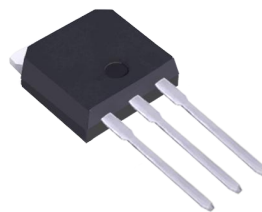
TO-220F



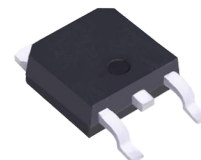
TO-262



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}	800	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current (Continuous) ($T_C=25^\circ\text{C}$)	I_D	8	A
Drain Current (Pulsed) (Note 1)	I_{DM}	32	A
Avalanche Current (Note 1)	I_{AR}	8	A
Single Pulse Avalanche Energy (Note 3)	E_{AS}	850	mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	17.8	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-220/TO-263	178	W
	TO-220F/TO-220F1 TO-220F4	59	
	TO-220F2	62	
Linear Derating Factor above ($T_C=25^\circ\text{C}$)	TO-220/TO-263	1.43	$W/^\circ\text{C}$
	TO-220F/TO-220F1 TO-220F4	0.47	
	TO-220F2	0.5	
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. $L = 25\text{mH}$, $I_{AS} = 8\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 8\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220/TO-263	0.7	$^\circ\text{C}/\text{W}$
	TO-220F/TO-220F1 TO-220F4	2.1	
	TO-220F2	2.0	

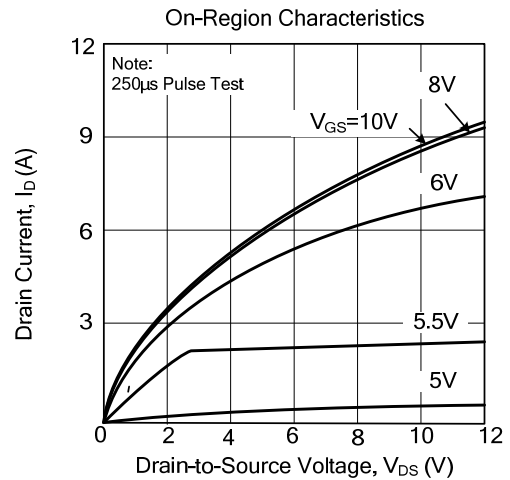
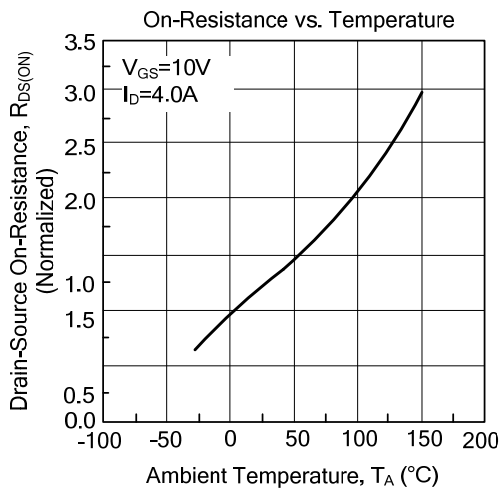
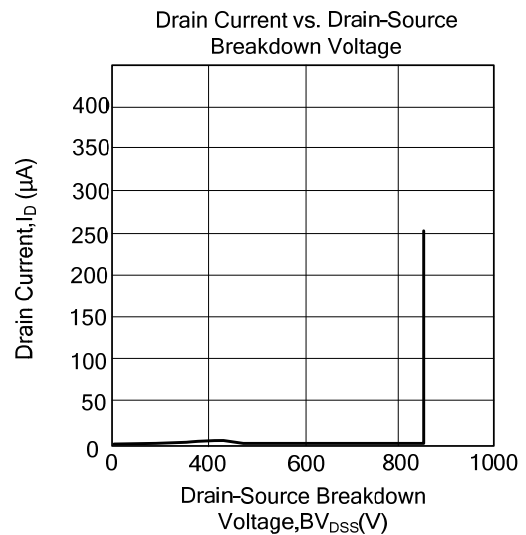
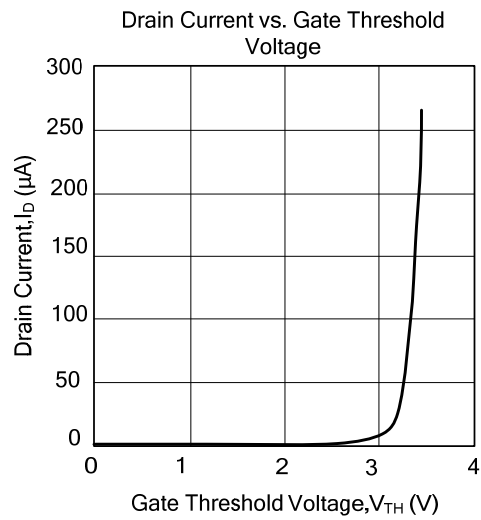
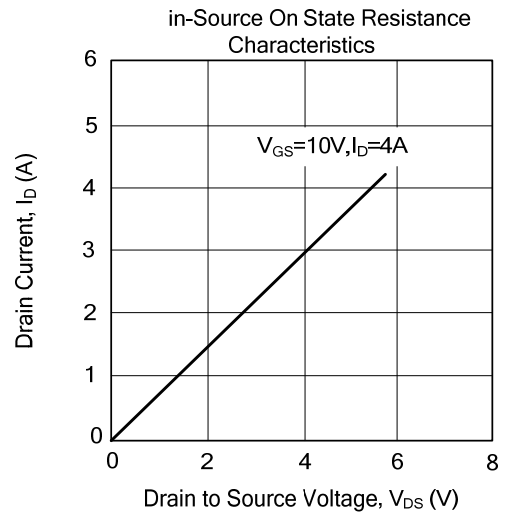
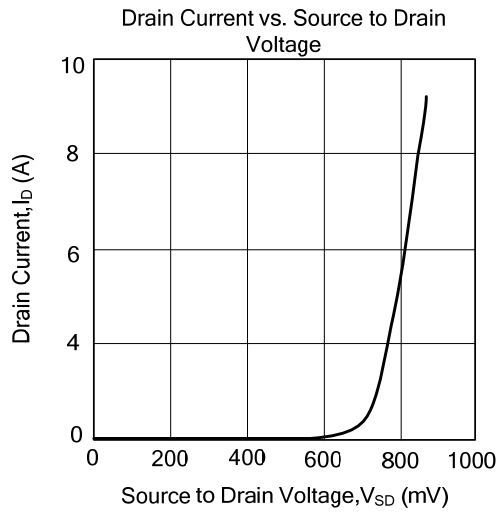
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	800			V	
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=250\mu\text{A}$		0.5		$\text{V}/^\circ\text{C}$	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800\text{V}$, $V_{GS}=0\text{V}$			10	μA	
		$V_{DS}=640\text{V}$, $T_C=125^\circ\text{C}$			100		
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30\text{V}$, $V_{DS}=0\text{V}$			± 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	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=4.0\text{A}$		1.18	1.45	Ω	
Forward Transconductance (Note 1)	g_{FS}	$V_{DS}=50\text{V}$, $I_D=4.0\text{A}$		5.6		S	
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		1580	2050	pF	
Output Capacitance	C_{OSS}				135	175	pF
Reverse Transfer Capacitance	C_{RSS}				13	17	pF
SWITCHING PARAMETERS (Note 1, Note 2)							
Total Gate Charge	Q_G	$V_{GS}=10\text{V}$, $V_{DS}=400\text{V}$, $I_D=8\text{A}$ $R_L=50\Omega$		47	60	nC	
Gate to Source Charge	Q_{GS}				10		nC
Gate to Drain Charge	Q_{GD}				14		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=400\text{V}$, $I_D=8\text{A}$, $R_G=25\Omega$		40	90	ns	
Rise Time	t_R				110	230	ns
Turn-OFF Delay Time	$t_{D(OFF)}$				65	140	ns
Fall-Time	t_F				70	150	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current	I_S				8	A	
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				32	A	
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=8\text{A}$, $V_{GS}=0\text{V}$			1.4	V	
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=8\text{A}$, $V_{GS}=0\text{V}$,		690		ns	
Reverse Recovery Charge (Note 1)	Q_{rr}	$di_F/dt=100\text{A}/\mu\text{s}$		8.2		μC	

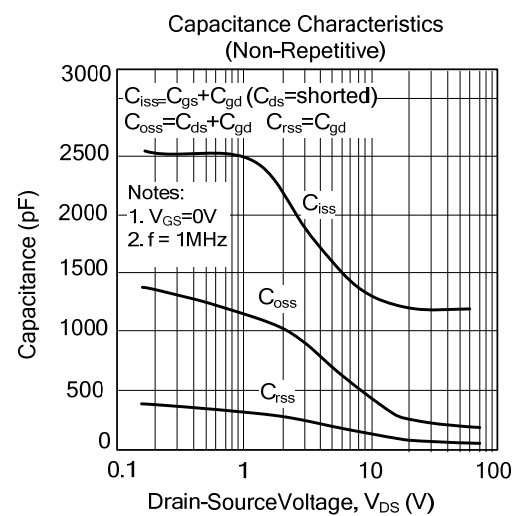
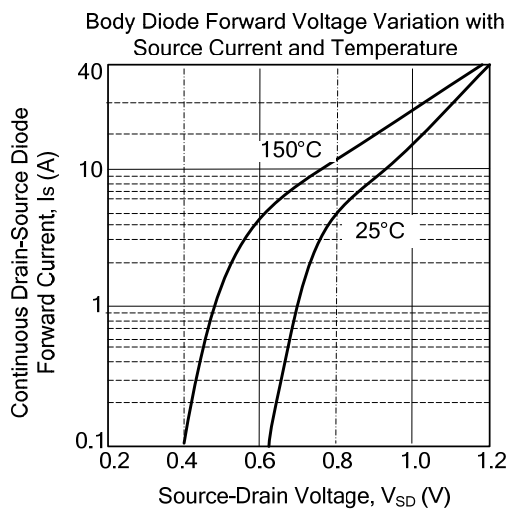
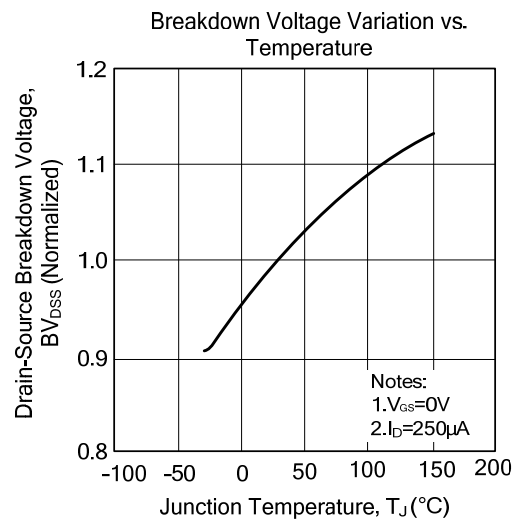
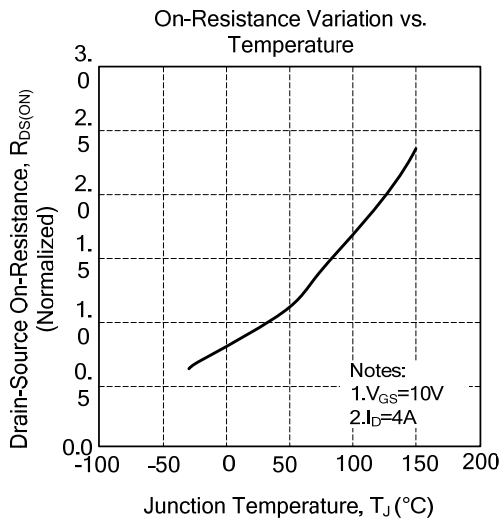
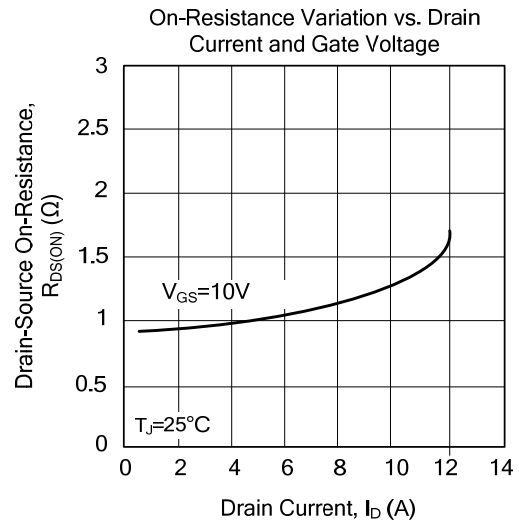
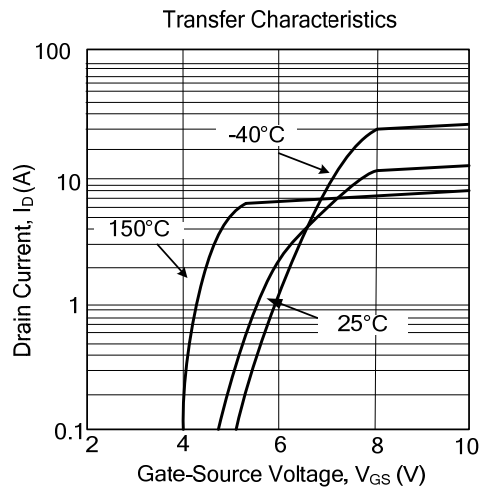
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)

