

10N80

Power MOSFET

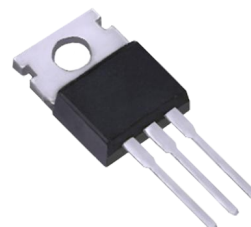
10A, 800V N-CHANNEL POWER MOSFET

■ DESCRIPTION

The UTC **10N80** 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

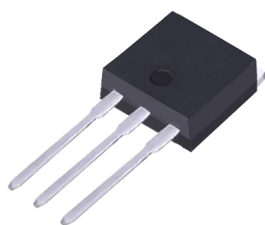
- * $R_{DS(ON)} \leq 1.1\Omega$ @ $V_{GS}=10V, I_D=5.0A$
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, High Ruggedness



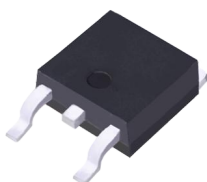
TO-220



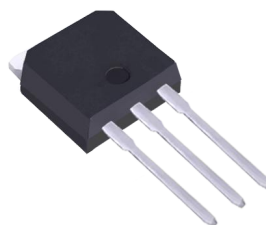
TO-220F



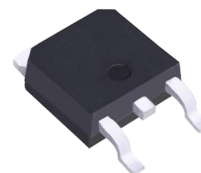
TO-262



TO-263



TO-251



TO-252

■ ABSOLUTE MAXIMUM 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
Continuous Drain Current ($T_C = 25^\circ\text{C}$)		I_D	10	A
Pulsed Drain Current (Note 2)		I_{DM}	20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	770	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.2	V/ns
Power Dissipation	TO-220F1	P_D	30	W
	TO-220F2			
	TO-263			
	TO-3P			
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. $L=10\text{mH}$, $I_{AS}=12.4\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

4. $I_{SD} \leq 10\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F1	θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
	TO-220F2			
	TO-263			
	TO-3P			
Junction to Case	TO-220F1	θ_{JC}	4.2	$^\circ\text{C}/\text{W}$
	TO-220F2			
	TO-263			
	TO-3P			

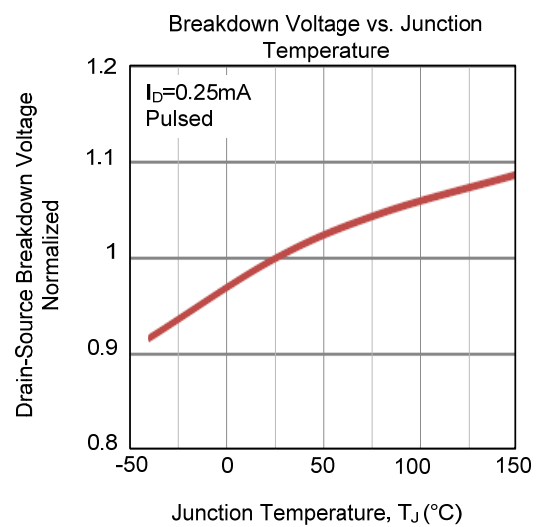
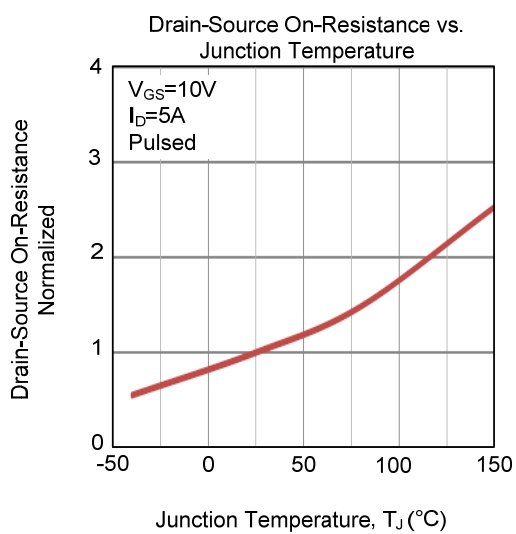
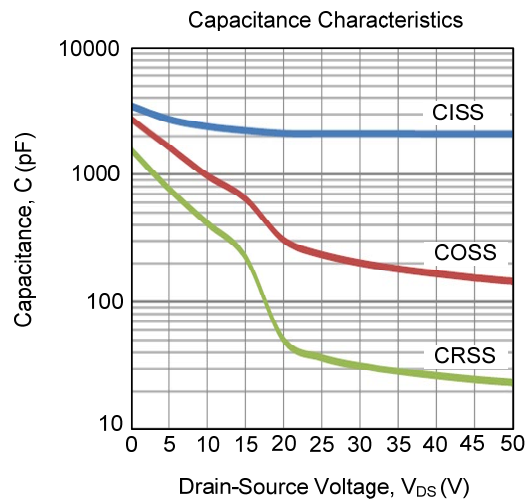
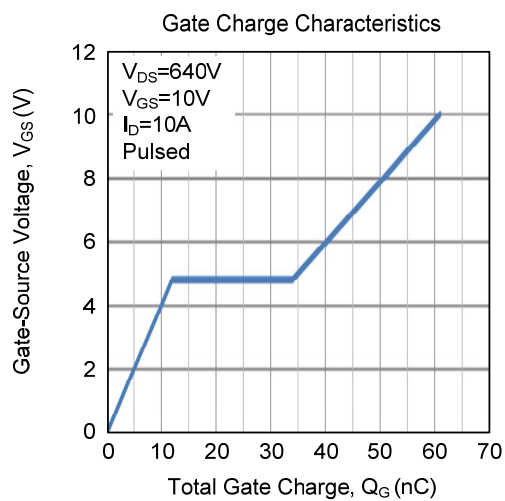
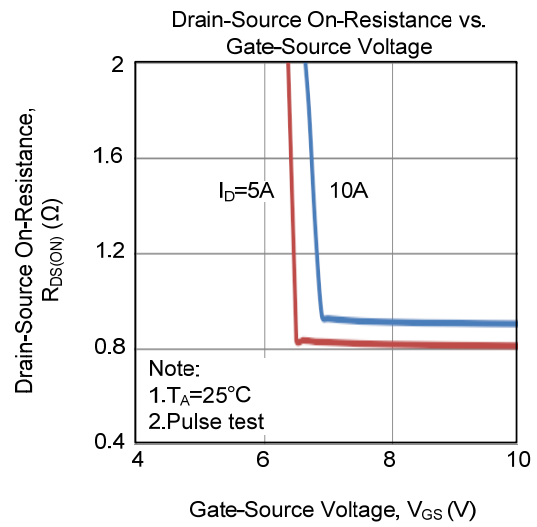
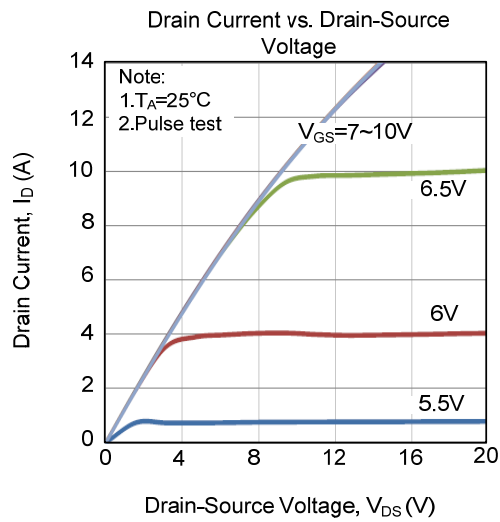
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\ \mu A$	800			V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V$			10	μA	
		$V_{DS}=640V, T_C=125^\circ\text{C}$			100		
Gate-Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 100	nA	
ON CHARACTERISTICS							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\ \mu A$	3.0		5.0	V	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5.0A$			1.1	Ω	
DYNAMIC PARAMETERS							
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$		2100		pF	
Output Capacitance	C_{OSS}				230		pF
Reverse Transfer Capacitance	C_{RSS}				36		pF
SWITCHING PARAMETERS							
Total Gate Charge	Q_G	$V_{DS}=640V, V_{GS}=10V, I_D=10A$ $I_G=1\text{mA}$ (Note 1,2)		61		nC	
Gate Source Charge	Q_{GS}			12			
Gate Drain Charge	Q_{GD}			20			
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=100V, V_{GS}=10V, I_D=10A,$ $R_G=25\Omega$ (Note 1,2)		38		ns	
Turn-ON Rise Time	t_R			27			
Turn-OFF Delay Time	$t_{D(OFF)}$			180			
Turn-OFF Fall-Time	t_F			60			
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current	I_S				10	A	
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				20		
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=10.0\text{A}, V_{GS}=0V$			1.4	V	
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, dI_F/dt=100\text{A}/\mu\text{s},$		530		ns	
Reverse Recovery Charge	Q_{rr}	$I_S=10.0A$ (Note 1)		9.8		nC	

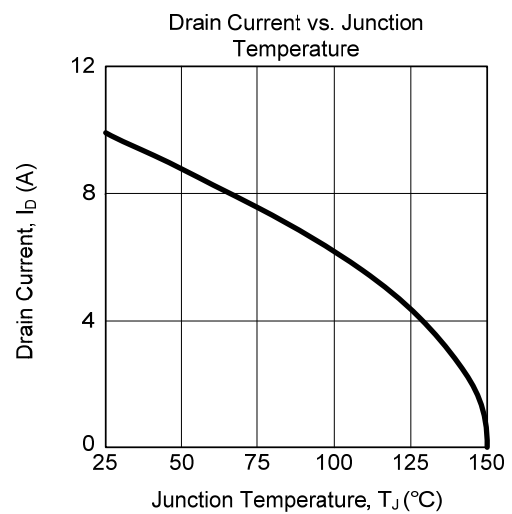
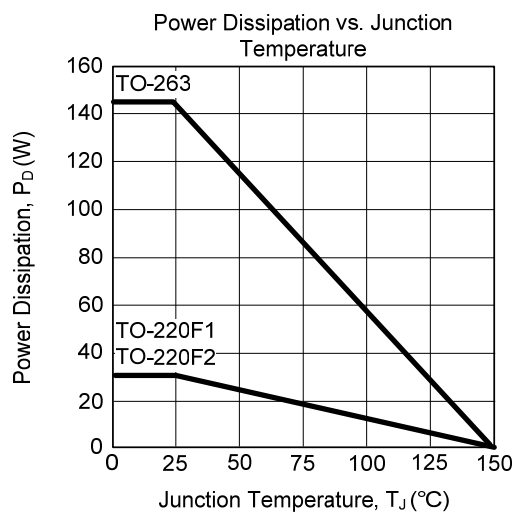
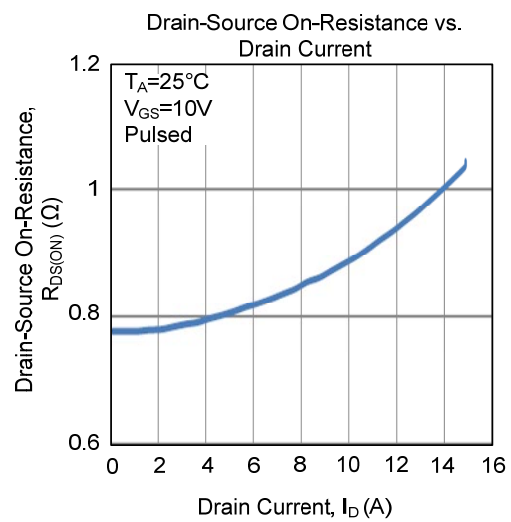
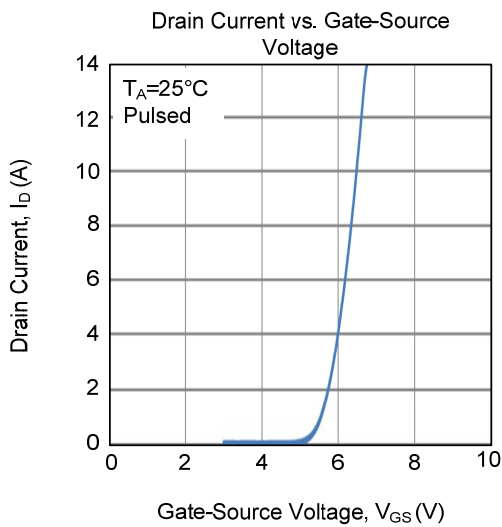
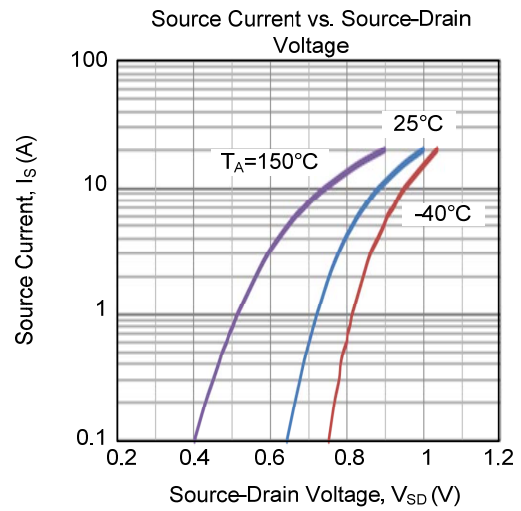
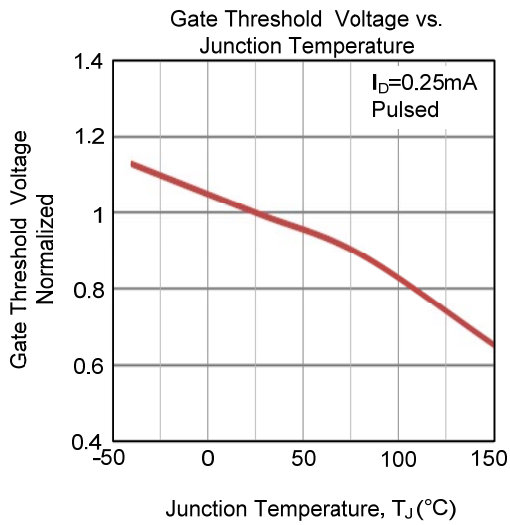
Notes: 1. Pulse Test: Pulse width $\leq 300\ \mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)

