

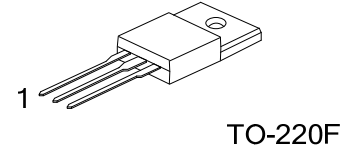
**2N80**

Preliminary

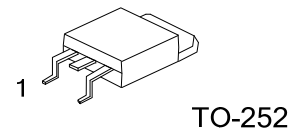
Power MOSFET**2 Amps, 800 Volts****N-CHANNEL POWER MOSFET**■ **DESCRIPTION**

The UTC **2N80** is an N-channel mode Power FET using UTC's advanced technology to provide customers planar stripe and DMOS technology. This technology is specialized in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **2N80** is universally applied in high efficiency switch mode power supply.



TO-220F

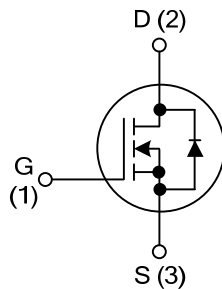


TO-252

■ **FEATURES**

* 2.4A, 800V, $R_{DS(on)} = 6.3\Omega$ @ $V_{GS} = 10V$

* High switching speed

■ **SYMBOL**■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
2N80L-TF3-T	2N80G-TF3-T	TO-220F	G	D	S	Tube
2N80L-TN3-R	2N80G-TN3-R	TO-252	G	D	S	Tape Reel

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

 2N80L-TF3-T ├── (1)Packing Type ├── (2)Package Type └── (3)Lead Free	(1) T: Tube, R: Tape Reel (2) TF3: TO-220F, TN3: TO-252 (3) G: Halogen Free, L: Lead Free
---	---

■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	800	V
Gate-Source Voltage		V_{GS}	± 30	V
Avalanche Current (Note 1)		I_{AR}	2.4	A
Drain Current	Continuous	I_D	2.4	A
	Pulsed (Note 1)	I_{DM}	9.6	A
Avalanche Energy	Single Pulsed (Note 2)	E_{AS}	180	mJ
	Repetitive (Note 1)	E_{AR}	8.5	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.0	V/ns
Power Dissipation	TO-220F	P_D	24	W
	TO-252		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.

■ THERMAL CHARACTERISTICS

PARAMETER	PACKAGE	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F	θ_{JA}	62.5	$^{\circ}\text{C/W}$
	TO-252		110	$^{\circ}\text{C/W}$
Junction to Case	TO-220F	θ_{JC}	5.2	$^{\circ}\text{C/W}$
	TO-252		2.85	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	800			V
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =250μA		0.9		V/°C
Drain-Source Leakage Current		I _{DSS}	V _{DS} =800V, V _{GS} =0V			10	μA
			V _{DS} =640V, T _C =125°C			100	
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =+30V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	3.0		5.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =1.2A		4.9	6.3	Ω
Forward Transconductance (Note 4)		g _{FS}	V _{DS} =50V, I _D =1.2A		2.65		S
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		425	550	pF
Output Capacitance		C _{OSS}			45	60	pF
Reverse Transfer Capacitance		C _{RSS}			5.5	7.0	pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 4,5)		Q _G	V _{GS} =10V, V _{DS} =640V, I _D =2.4A		12	15	nC
Gate to Source Charge (Note 4,5)		Q _{GS}			2.6		nC
Gate to Drain Charge (Note 4,5)		Q _{GD}			6.0		nC
Turn-ON Delay Time (Note 4,5)		t _{D(ON)}	V _{DD} =400V, I _D =2.4A, R _G =25Ω		12	35	ns
Rise Time (Note 4,5)		t _R			30	70	ns
Turn-OFF Delay Time (Note 4,5)		t _{D(OFF)}			25	60	ns
Fall-Time (Note 4,5)		t _F			28	65	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				2.4	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				9.6	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =2.4A, V _{GS} =0V			1.4	V
Reverse Recovery Time (Note 4)		t _{RR}	I _S =2.4A, V _{GS} =0V, dI _F /dt=100A/μs		480		ns
Reverse Recovery Charge (Note 4)		Q _{RR}			2.0		μC

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

2. L = 59mH, I_{AS} = 2.4A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

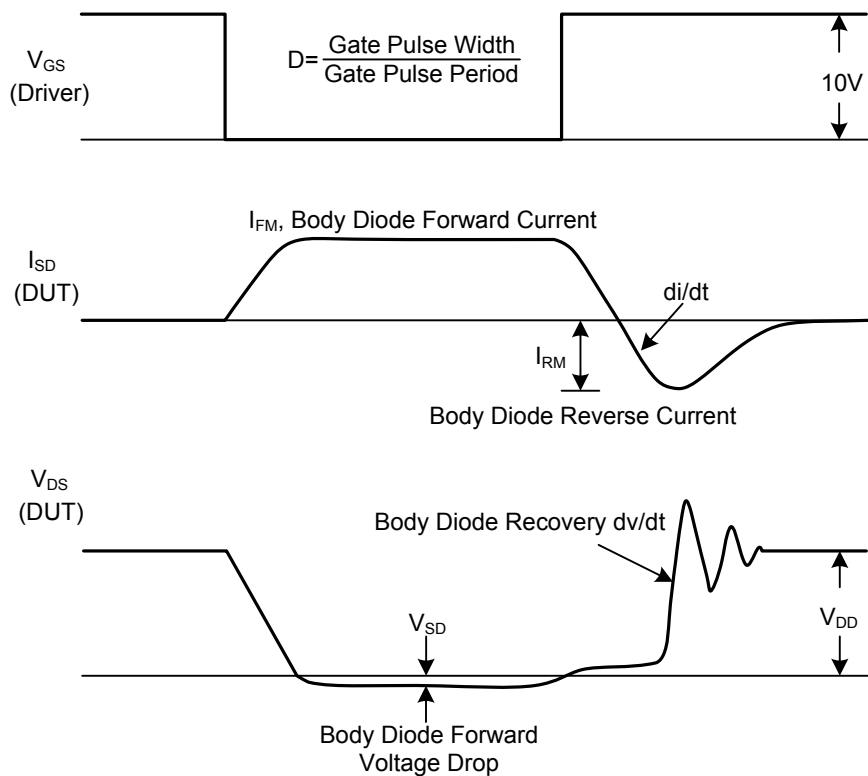
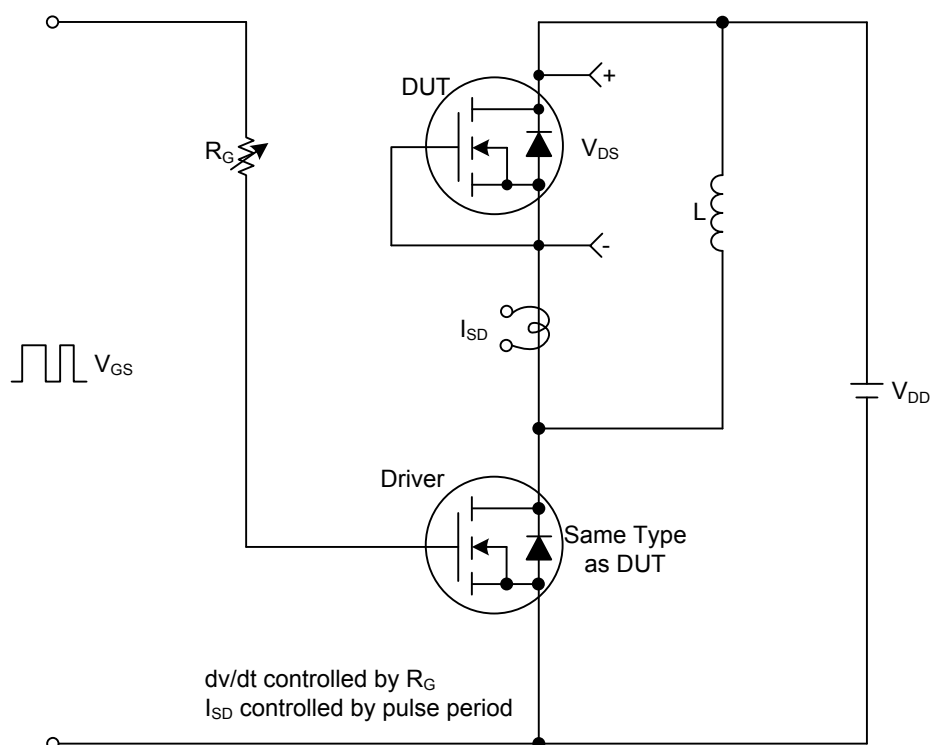
3. I_{SD} ≤ 2.4A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

4. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

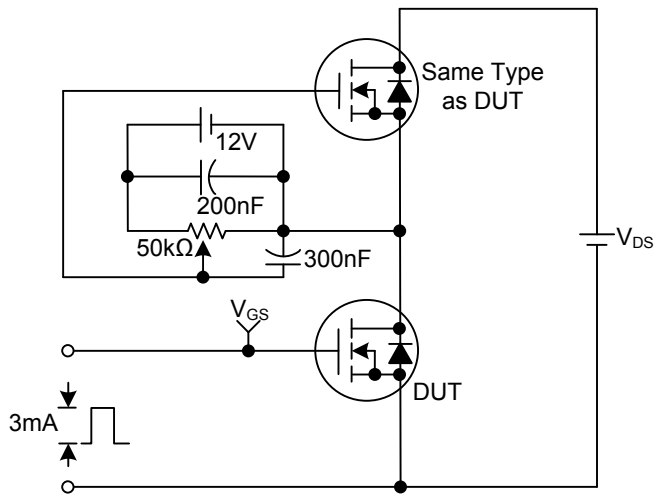
5. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

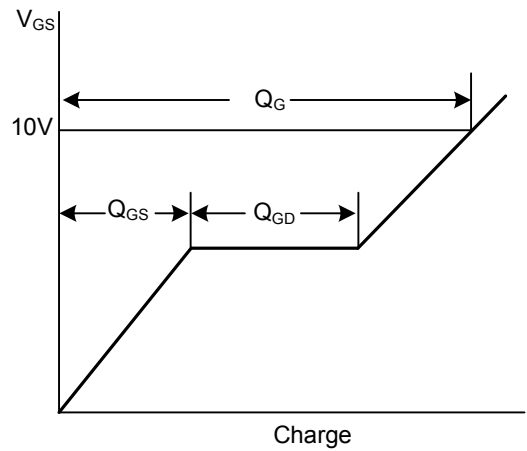
Peak Diode Recovery dv/dt Test Circuit & Waveforms



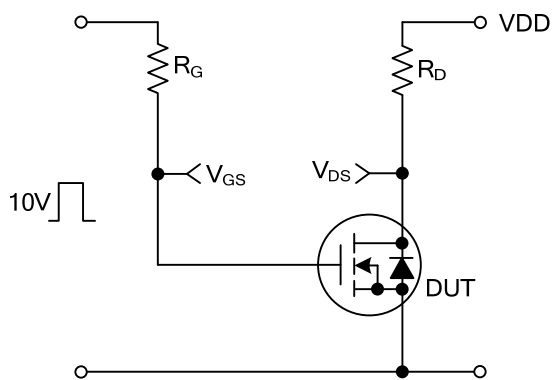
Gate Charge Test Circuit



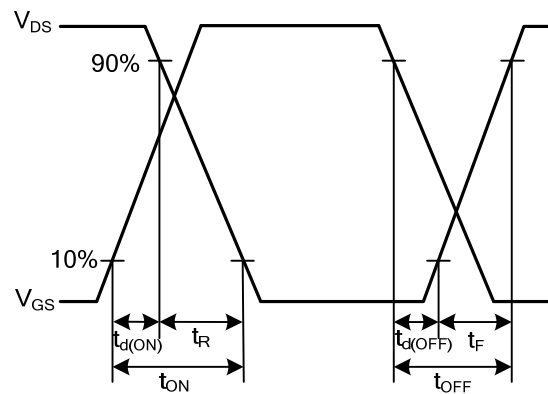
Gate Charge Waveforms



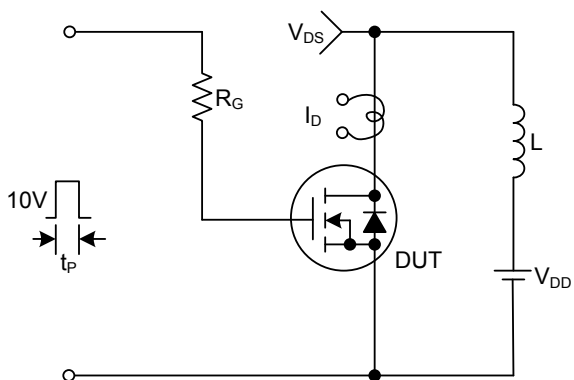
Resistive Switching Test Circuit



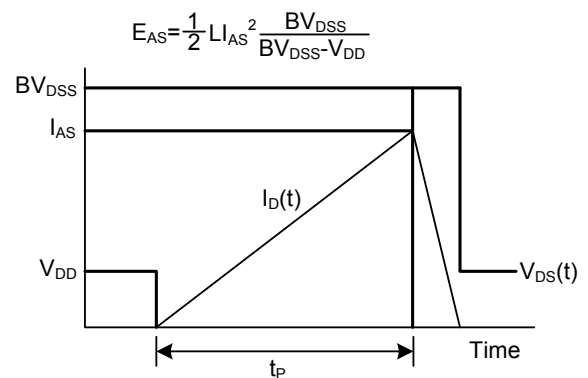
Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.