



5N80

Power MOSFET

5A, 800V N-CHANNEL POWER MOSFET

■ DESCRIPTION

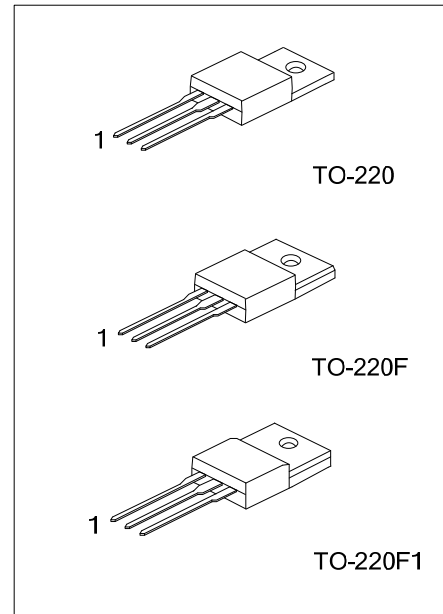
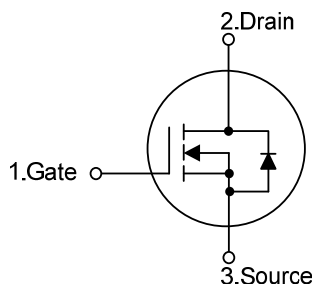
The UTC **5N80** is a N-channel enhancement mode power MOSFET. It use UTC advanced technology to provide avalanche rugged technology and low gate charge.

It can be applied in high current, high speed switching, switch mode power supplies (SMPS), consumer and industrial lighting, DC-AC inverters for welding equipment and uninterruptible power supply(UPS).

■ FEATURES

- * $R_{DS(ON)}$: 2.0Ω (TYP.)
- * Avalanche rugged technology
- * Low input capacitance
- * Low gate charge
- * Application oriented characterization

■ SYMBOL



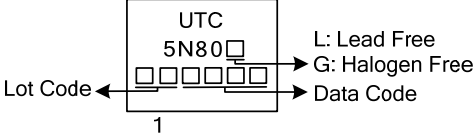
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
5N80L-TA3-T	5N80G-TA3-T	TO-220	G	D	S	Tube
5N80L-TF1-T	5N80G-TF1-T	TO-220F1	G	D	S	Tube
5N80L-TF3-T	5N80G-TF3-T	TO-220F	G	D	S	Tube

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

<p>5N80L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TF1:TO-220F1, TF3: TO-220F</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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MARKING INFORMATION

PACKAGE	MARKING
TO-220 TO-220F TO-220F1	 <p>UTC 5N80</p> <p>Lot Code</p> <p>Data Code</p> <p>L: Lead Free G: Halogen Free</p> <p>1</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage	$V_{GS}=0$	V_{DS}	800	V
Gate-Source Voltage		V_{GS}	± 30	V
Drain-Gate Voltage	$R_{GS}=20\text{k}\Omega$	V_{DGR}	800	V
Drain Current (Continuous)	Continuous	I_D	5.5	A
	Pulsed (Note 2)	I_{DM}	20	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	320	mJ
Power Dissipation	TO-220	P_D	125	W
	TO-220F /TO-220F1		40	
Derating Factor	TO-220		1	W/ $^\circ\text{C}$
	TO-220F /TO-220F1		0.32	
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. Pulse width limited by safe operating area.

3. Starting $T_J=25^\circ\text{C}$, $I_D=I_{AR}$, $V_{DD}=50\text{V}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	$^\circ\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	1	$^\circ\text{C}/\text{W}$
	TO-220F /TO-220F1		3.12	

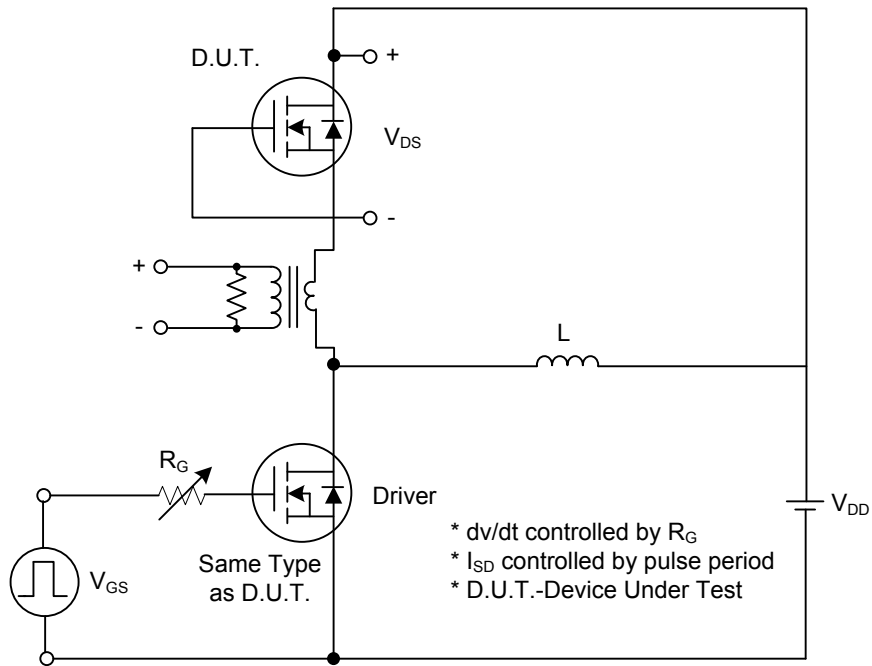
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	800			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =800V, V _{GS} =-0V			25	μA
Gate- Source Leakage Current	I _{GSS}	V _{GS} =+30V			+100	nA
		V _{GS} =-30V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	3		5	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.5A		1.8	2.5	Ω
		V _{GS} =10V, I _D =2.5A, T _C =100°C			4	
On State Drain Current	I _{D(ON)}	V _{DS} >I _{D(ON)} ×R _{DS(ON)} max, V _{GS} =10V	5			A
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		900	1450	pF
Output Capacitance	C _{OSS}			100	200	pF
Reverse Transfer Capacitance	C _{RSS}			14	20	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DD} =120V, I _D =5A (Note 1, 2)		145	170	nC
Gate to Source Charge	Q _{GS}			11		nC
Gate to Drain Charge	Q _{GD}			27		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DS} =30V, I _D =1A, R _G =50Ω V _{GS} =10V (Note 1, 2)		80	100	ns
Rise Time	t _R			135	150	ns
Turn-OFF Delay Time	t _{D(OFF)}			240	260	ns
Fall-Time	t _F			120	140	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	I _{SD} =5.5A, V _{GS} =0V			2	V
Reverse Recovery Time	t _{rr}	I _{SD} =5.5A, di/dt=100A/μs, V _{DD} =80V, T _J =150°C (Note 1)		700		ns
Reverse Recovery Charge	Q _{RR}			7.7		nC
Reverse Recovery Current	I _{RRM}			22		A
Source-Drain Current	I _{SD}				5.5	A
Source-Drain Current (Pulsed) (Note 1)	I _{SDM}				20	A

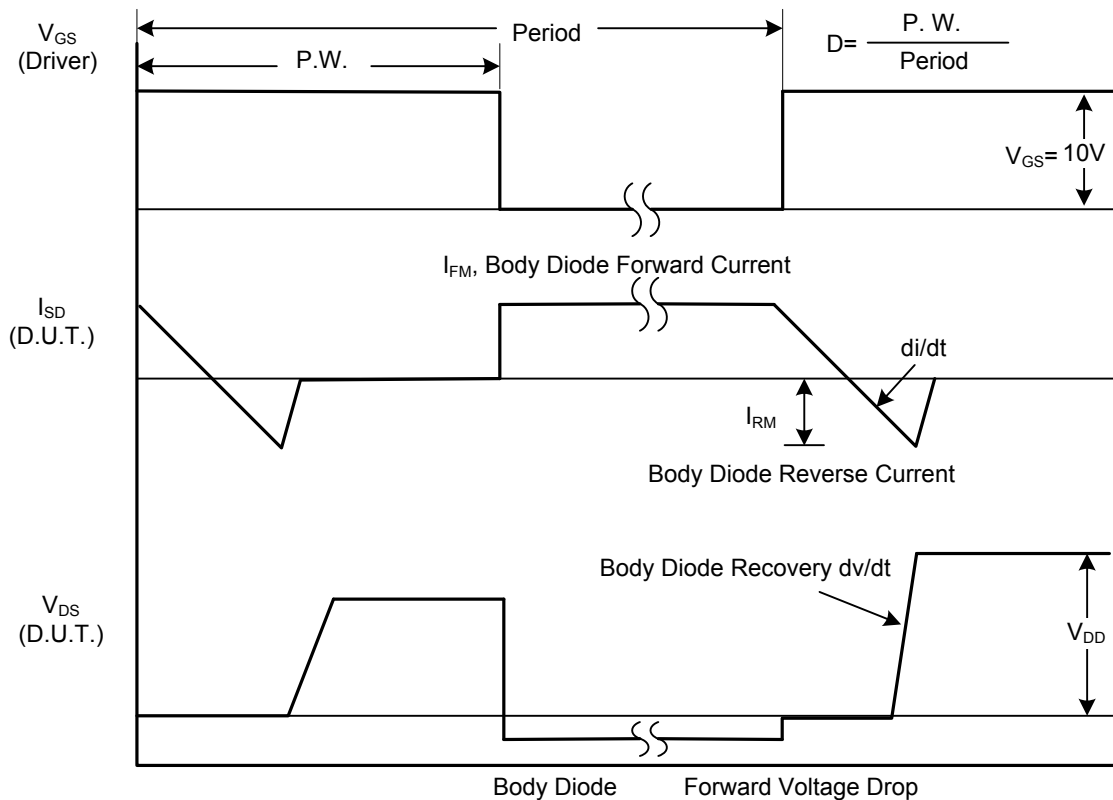
Notes: 1. Pulsed: Pulse duration=300μs, duty cycle 1.5%.

2. Essentially independent of operating temperature

■ TEST CIRCUITS AND WAVEFORMS

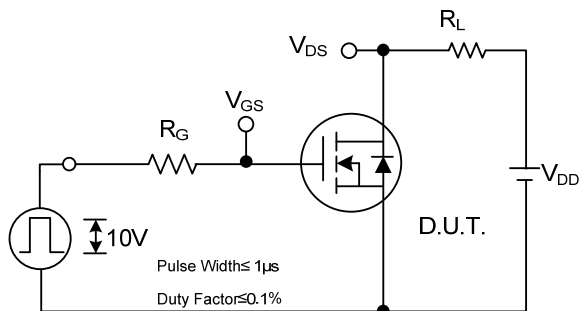


Peak Diode Recovery dv/dt Test Circuit

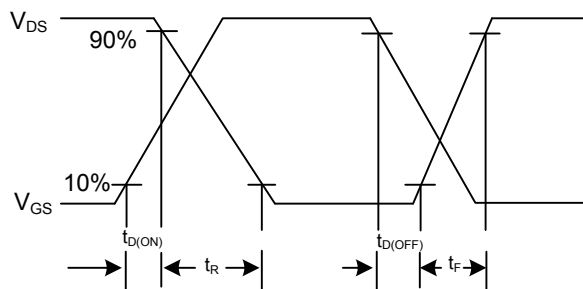


Peak Diode Recovery dv/dt Waveforms

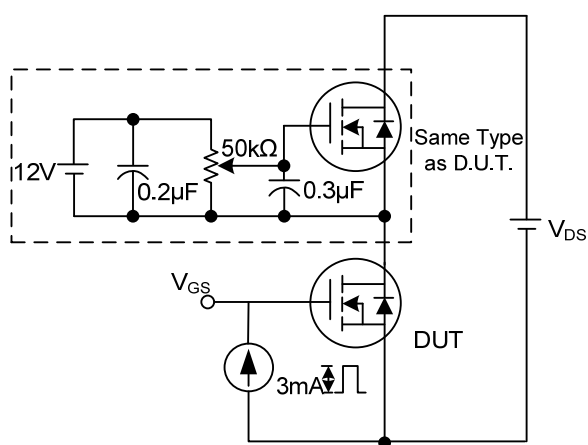
TEST CIRCUITS AND WAVEFORMS(Cont.)



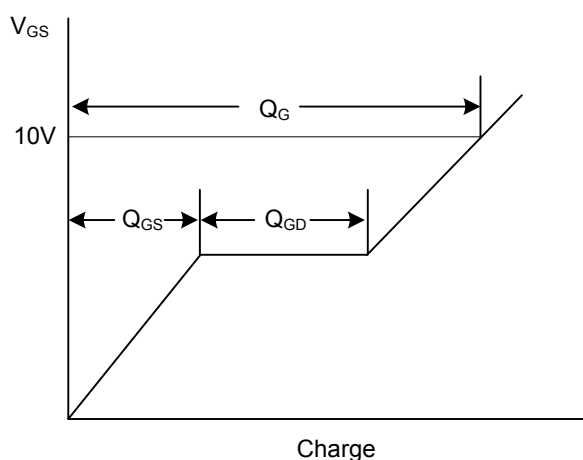
Switching Test Circuit



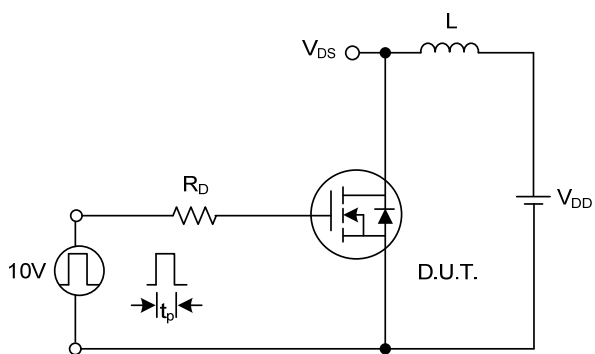
Switching Waveforms



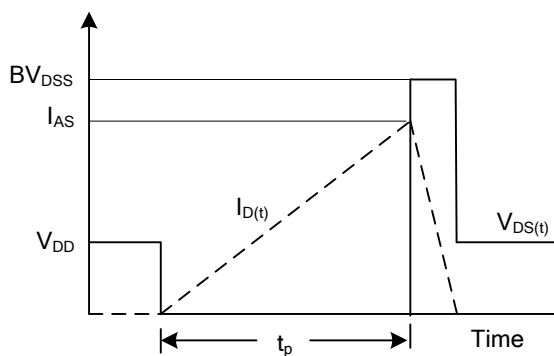
Gate Charge Test Circuit



Gate Charge Waveform

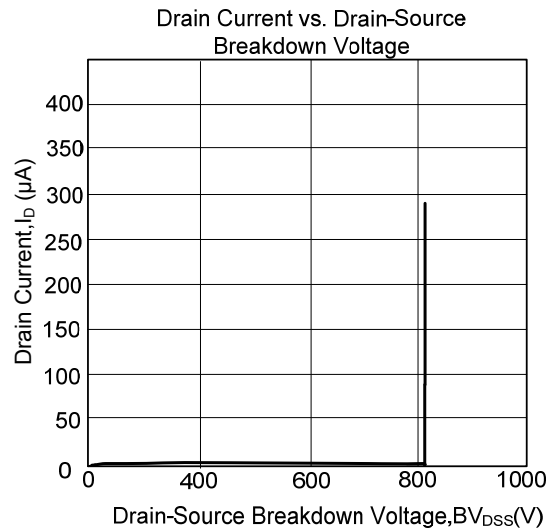
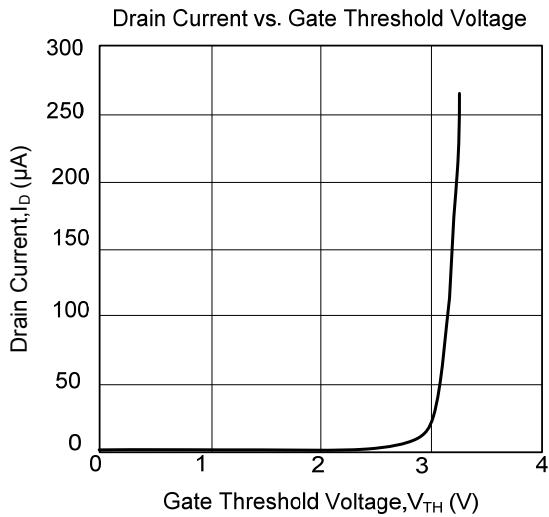
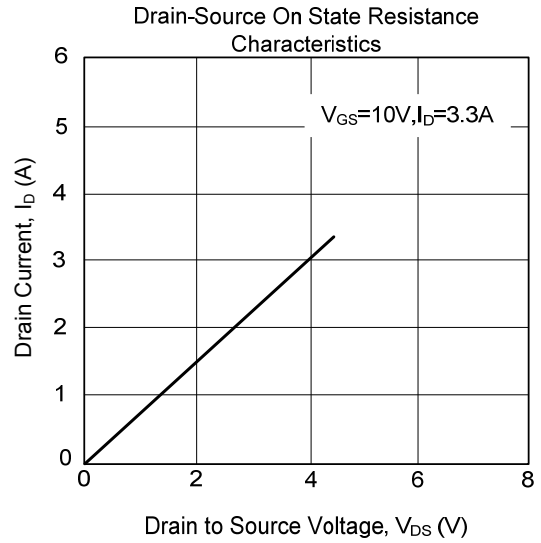
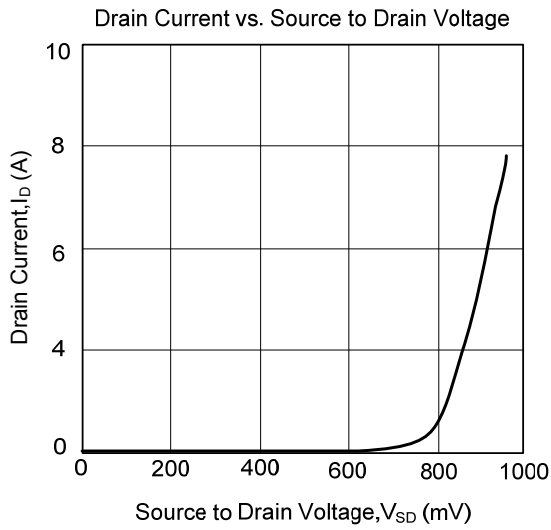


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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