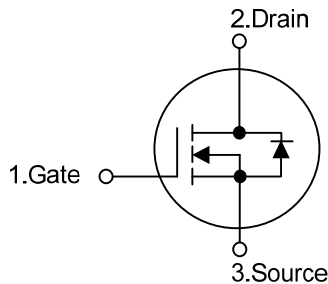


**7NM80-Q****Power MOSFET****7.0A, 800V N-CHANNEL
SUPER-JUNCTION MOSFET****DESCRIPTION**

The UTC 7NM80-Q is a Super Junction MOSFET Structure and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and a high rugged avalanche characteristics. This power MOSFET is usually used at AC-DC converters for power applications.

FEATURES

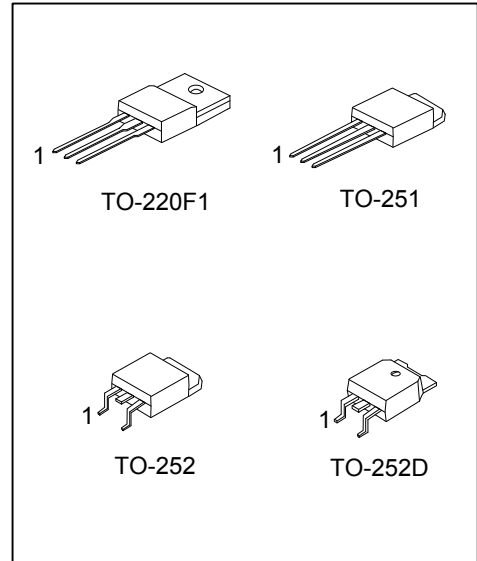
- * $R_{DS(ON)} \leq 1.1 \Omega$ @ $V_{GS}=10V$, $I_D=3.5A$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

SYMBOL**ORDERING INFORMATION**

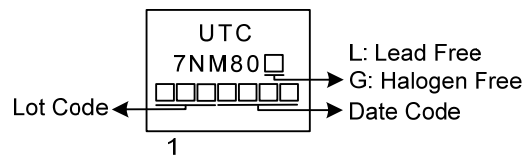
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
7NM80L-TF1-T	7NM80G-TF1-T	TO-220F1	G	D	S	Tube
7NM80L-TM3-T	7NM80G-TM3-T	TO-251	G	D	S	Tube
7NM80L-TN3-R	7NM80G-TN3-R	TO-252	G	D	S	Tape Reel
7NM80L-TND-R	7NM80G-TND-R	TO-252D	G	D	S	Tape Reel

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

7NM80G-TF1-T (1) Packing Type (2) Package Type (3) Green Package		(1) T: Tube, R: Tape Reel (2) TF1: TO-220F1, TM3: TO-251, TN3: TO-252, TND: TO-252D (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°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	Continuous	T _C = 25°C	I _D	7	A
		T _C =100°C		4.5	A
Pulsed Drain Current	Pulsed (Note 2)		I _{DM}	21	A
Single Pulsed Avalanche Energy	Single Pulsed (Note 3)		E _{AS}	221	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	2.8	V/ns
Power Dissipation	TO-220F1		P _D	26	W
	TO-251/TO-252			30	W
	TO-252D				
Junction Temperature			T _J	+150	°C
Storage Temperature			T _{STG}	-55 ~ +150	°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 = 100mH, I_{AS} = 2.1A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C.

4. I_{SD} ≤ 7.0A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F1	θ _{JA}	62.5	°C/W
	TO-251/TO-252		110	°C/W
	TO-252D			
Junction to Case	TO-220F1	θ _{JC}	4.8	°C/W
	TO-251/TO-252		4.16 (Note)	°C/W
	TO-252D			

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

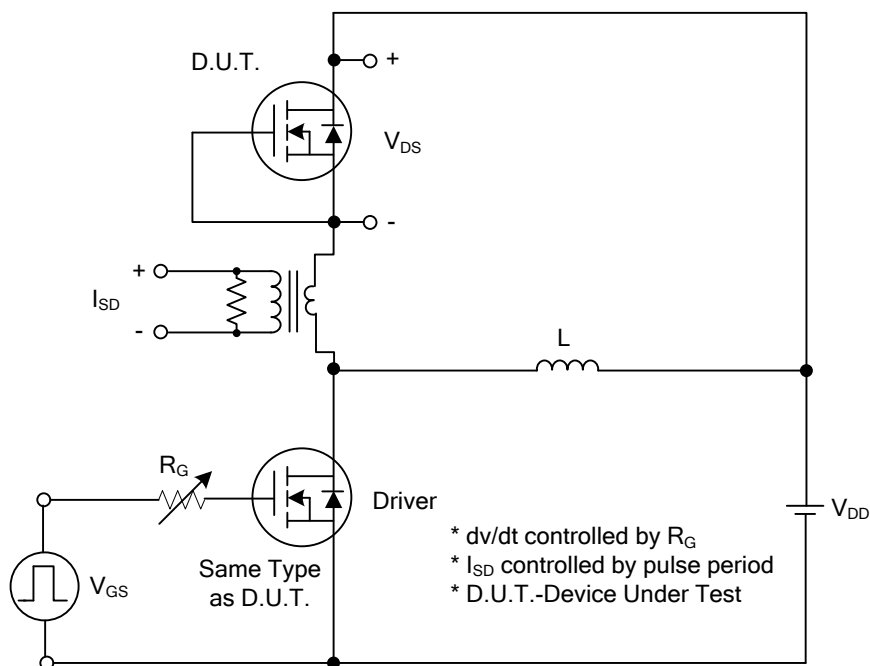
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	800			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =800V, V _{GS} =0V			10	μA
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	2.5		4.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =3.5A			1.1	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		490		pF
Output Capacitance		C _{OSS}			71		pF
Reverse Transfer Capacitance		C _{RSS}			3.7		pF
SWITCHING CHARACTERISTICS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =480V, V _{GS} =10V, I _D =7.0A I _G =1mA (Note 1, 2)		22.7		nC
Gate to Source Charge		Q _{GS}			6.5		nC
Gate to Drain Charge		Q _{GD}			7.2		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DS} =100V, V _{GS} =10V, I _D =7.0A, R _G =25Ω (Note 1, 2)		8		nS
Rise Time		t _R			20		nS
Turn-OFF Delay Time		t _{D(OFF)}			57		nS
Fall-Time		t _F			35		nS
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				7	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				21	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =7.0A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =7.0A, V _{GS} =0V,		350		nS
Body Diode Reverse Recovery Charge		Q _{rr}	dl _F /dt=100A/μs		8.5		μC

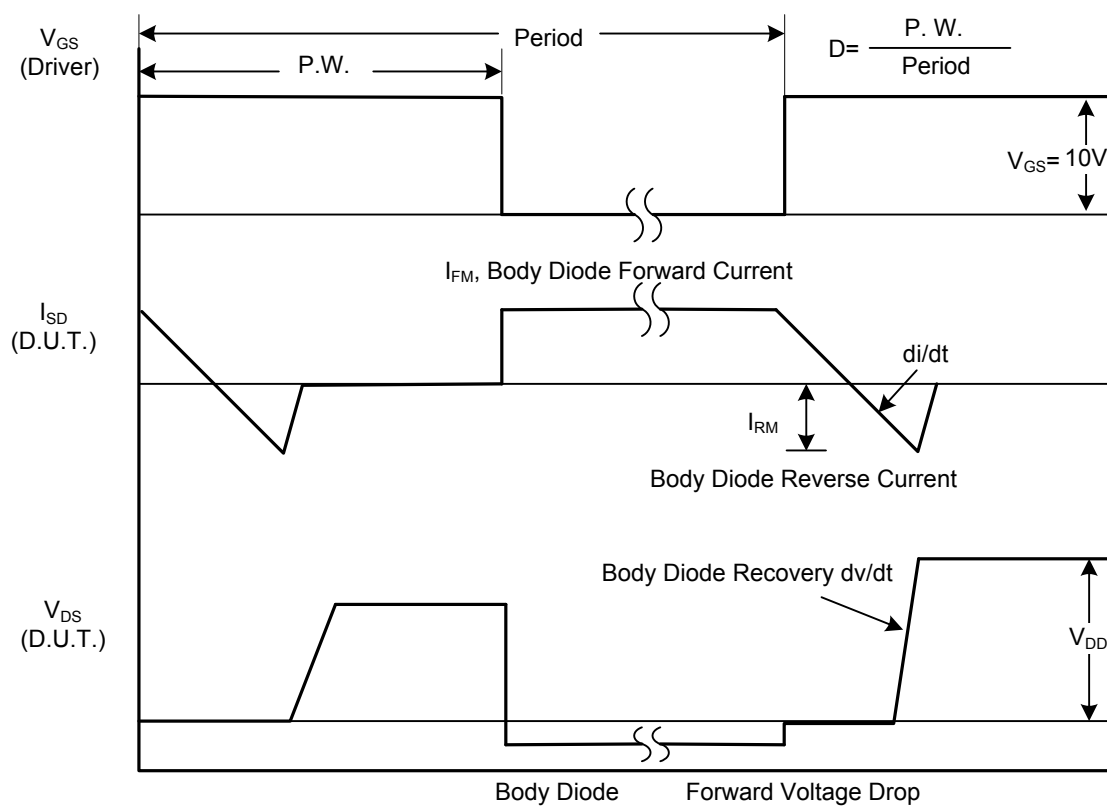
Notes: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS

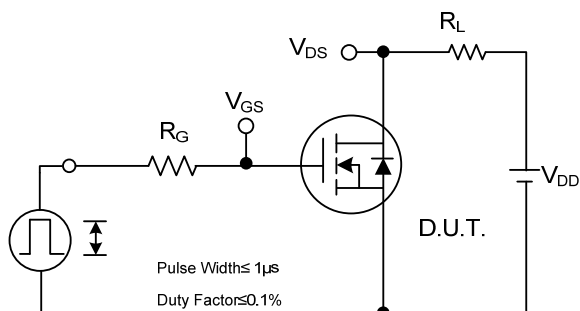


Peak Diode Recovery dv/dt Test Circuit

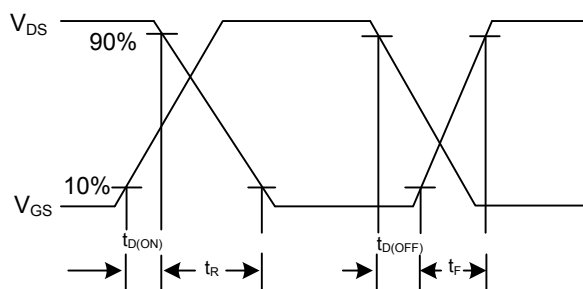


Peak Diode Recovery dv/dt Waveforms

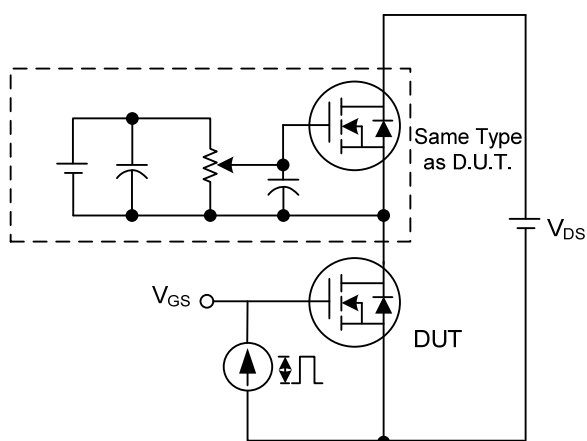
■ TEST CIRCUITS AND WAVEFORMS



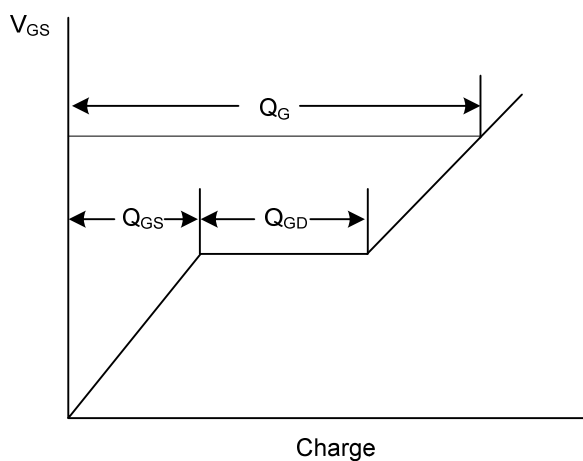
Switching Test Circuit



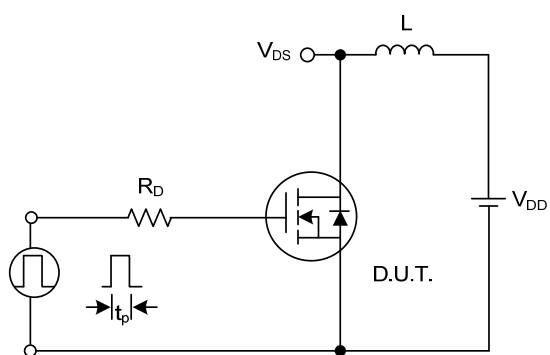
Switching Waveforms



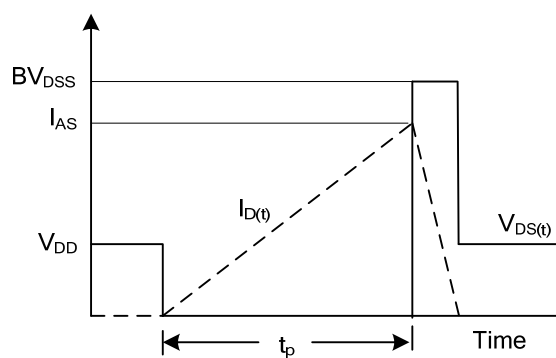
Gate Charge Test Circuit



Gate Charge Waveform

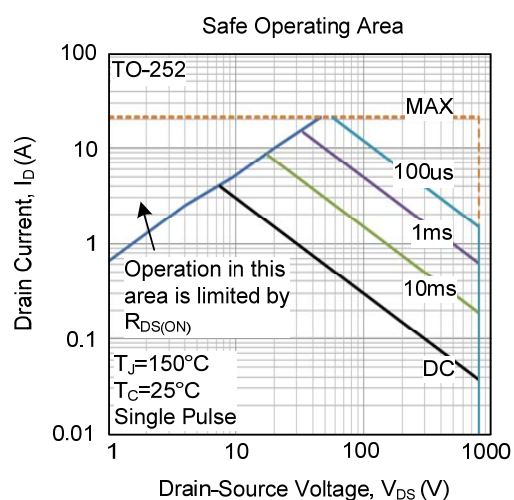
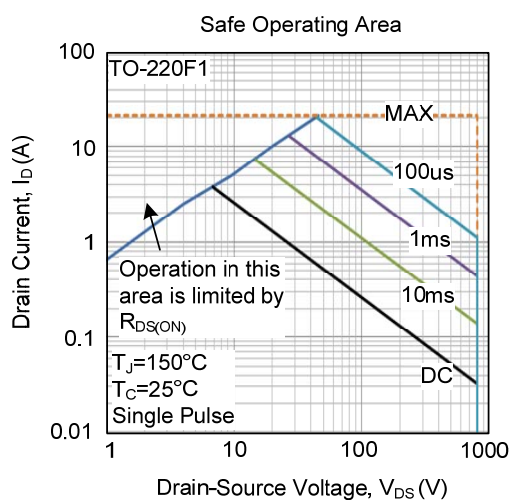


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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