



8NM80A-Q

Preliminary

Power MOSFET

8.0A, 800V N-CHANNEL SUPER-JUNCTION MOSFET

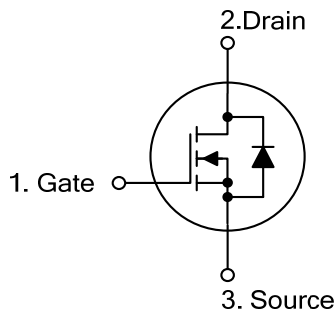
DESCRIPTION

The **UTC 8NM80A-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

- * $R_{DS(ON)} \leq 0.85 \Omega$ @ $V_{GS}=10V$, $I_D=4.0A$
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

SYMBOL

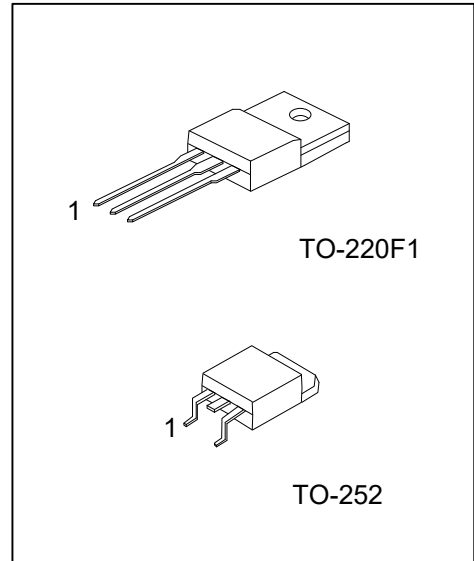


ORDERING INFORMATION

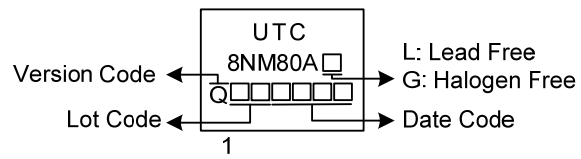
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
8NM80AL-Q-TF1-T	8NM80AG-Q-TF1-T	TO-220F1	G	D	S	Tube
8NM80AL-Q-TN3-R	8NM80AG-Q-TN3-R	TO-252	G	D	S	Tape Reel

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

8NM80AG-Q-TF1-T	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) TF1: TO-220F1, TN3: TO-252
	(3)Version Code	(3) Version Q
	(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING



■ **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°C	I _D	8	A
		T _C =100°C		4.8	A
	Pulsed (Note 2)		I _{DM}	16	A
Avalanche Energy	Single Pulsed (Note 3)		E _{AS}	272	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	6.8	V/ns
Power Dissipation	TO-220F1		P _D	27	W
	TO-252			31	W
Junction Temperature			T _J	+150	°C
Storage Temperature Range			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. $L = 100\text{mH}$, $I_{AS} = 2.3\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$ Starting $T_J = 25^{\circ}\text{C}$.

4. $I_{SD} \leq 8.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$.

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F1	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-252		110	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220F1	θ_{JC}	4.63	$^{\circ}\text{C}/\text{W}$
	TO-252		4.03 (Note)	$^{\circ}\text{C}/\text{W}$

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

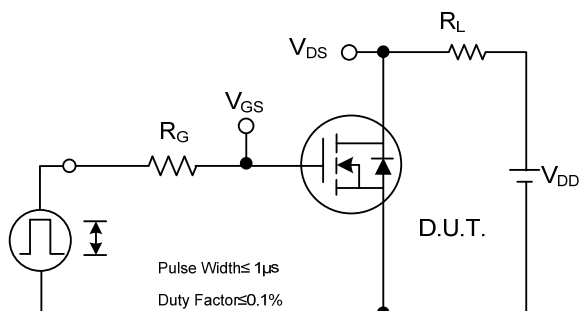
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

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	I _{GSS}	V _{DS} =0V ,V _{GS} =±30V			±10	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.5		4.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =4.0A		0.75	0.85	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		608		pF
Output Capacitance	C _{OSS}			78		pF
Reverse Transfer Capacitance	C _{RSS}			3		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =640V, V _{GS} =10V, I _D =8.0A , (Note 1, 2)		30.2		nC
Gate to Source Charge	Q _{GS}			7.7		nC
Gate to Drain Charge	Q _{GD}			14		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =8.0A, R _G =25Ω (Note 1, 2)		8		ns
Rise Time	t _R			20		ns
Turn-OFF Delay Time	t _{D(OFF)}			65		ns
Fall-Time	t _F			33		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				8	A
Maximum Body-Diode Pulsed Current	I _{SM}				16	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =8.0A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =8.0A, V _{GS} =0V,		368		ns
Body Diode Reverse Recovery Charge	Q _{rr}	dl _F /dt=100A/μs		4.76		μC

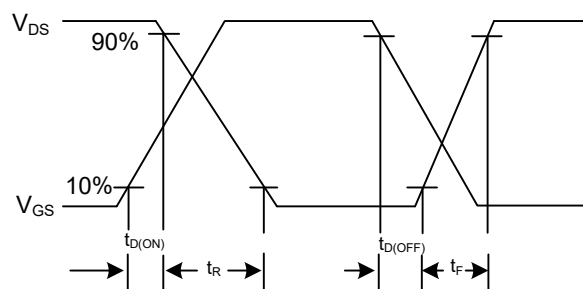
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

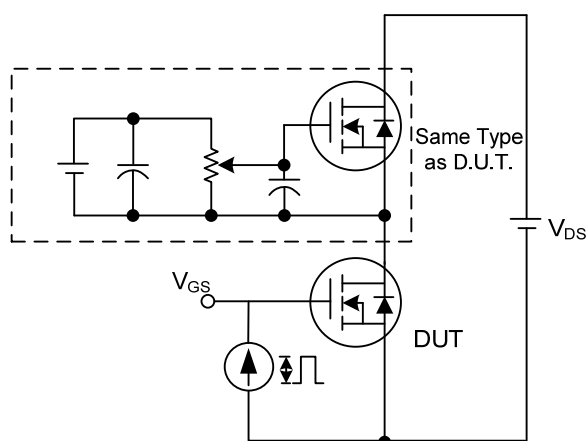
■ TEST CIRCUITS AND WAVEFORMS



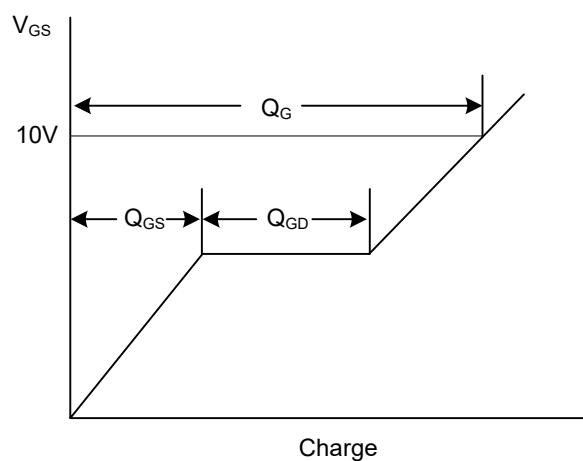
Switching Test Circuit



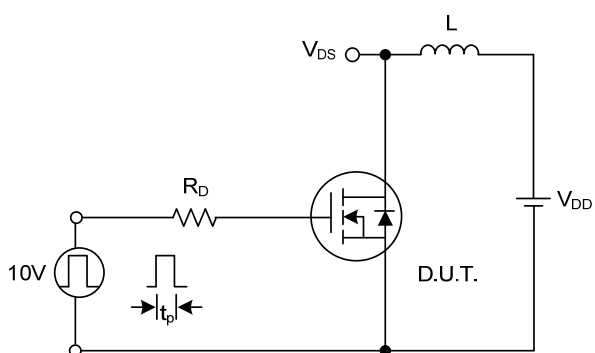
Switching Waveforms



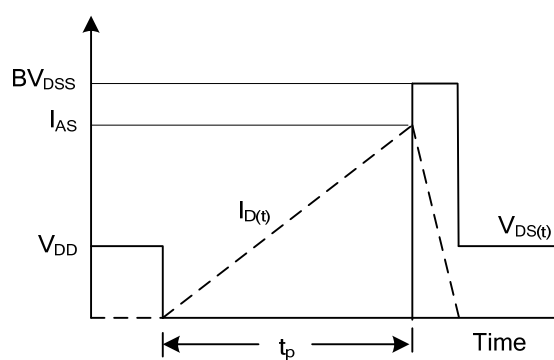
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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