



## UNA08R080M

Advance

POWER MOSFET

### 70A, 80V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET

#### DESCRIPTION

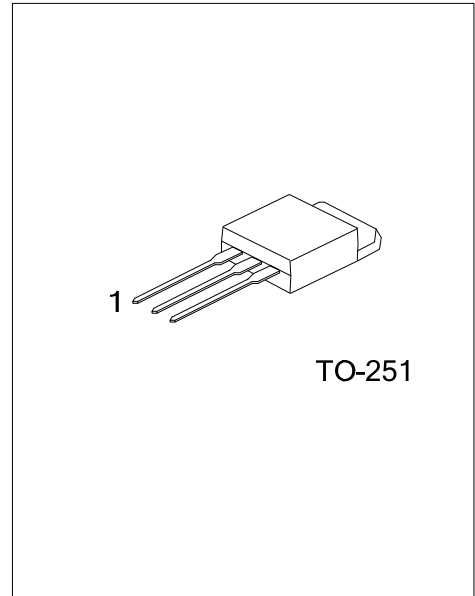
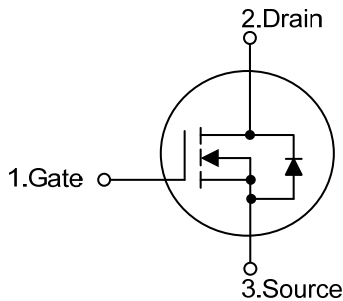
The UTC **UNA08R080M** is an N-channel Power MOSFET, it uses UTC's advanced technology that is uniquely optimized to provide an extremely low on-state resistance and low gate charge, etc.

The UTC **UNA08R080M** is suitable for synchronous rectification in SMPS, UPS, high speed power switching, etc.

#### FEATURES

- \*  $R_{DS(ON)} < 8m\Omega @ V_{GS}=10V, I_D=40A$
- \* High power and current handling capability
- \* High speed switching
- \* Low gate charge

#### SYMBOL



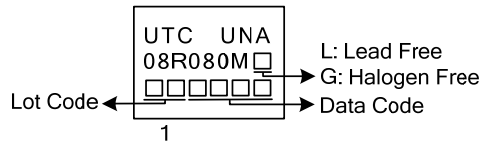
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UNA08R080ML-TN3-R	UNA08R080MG-TN3-R	TO-252	G	D	S	Tape Reel

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

UNA08R080ML-TM3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) TM3: TO-251
	(3)Green Package	(3) L: Lead Free, G: Halogen Free and Lead Free

### ■ MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			$V_{DSS}$	80	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Drain Current(Note2)	Continuous	$T_C=25^\circ\text{C}$	$I_D$	70	A
Pulsed Drain Current(Note 3)			$I_{DM}$	280	A
Avalanche Current			$I_{AS}$	70	A
Avalanche Energy (Note4)			$E_{AS}$	245	mJ
Power Dissipation		$T_C=25^\circ\text{C}$	$P_D$	150	W
		$T_C=100^\circ\text{C}$		75	W
Junction Temperature			$T_J$	150	$^\circ\text{C}$
Storage Temperature Range			$T_{STG}$	-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. Current limited by bond wire.
3. Repetitive Rating: Pulse width limited by maximum junction temperature
4.  $L=0.1\text{mH}$ ,  $I_{AS}=70\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J = 25^\circ\text{C}$
5.  $I_{SD} \leq 20\text{A}$ ,  $di/dt \leq 200\text{A}/\mu\text{s}$ ,  $V_{DD} \leq BV_{DSS}$ , Starting  $T_J = 175^\circ\text{C}$

■ THERMAL RESISTANCES CHARACTERISTICS

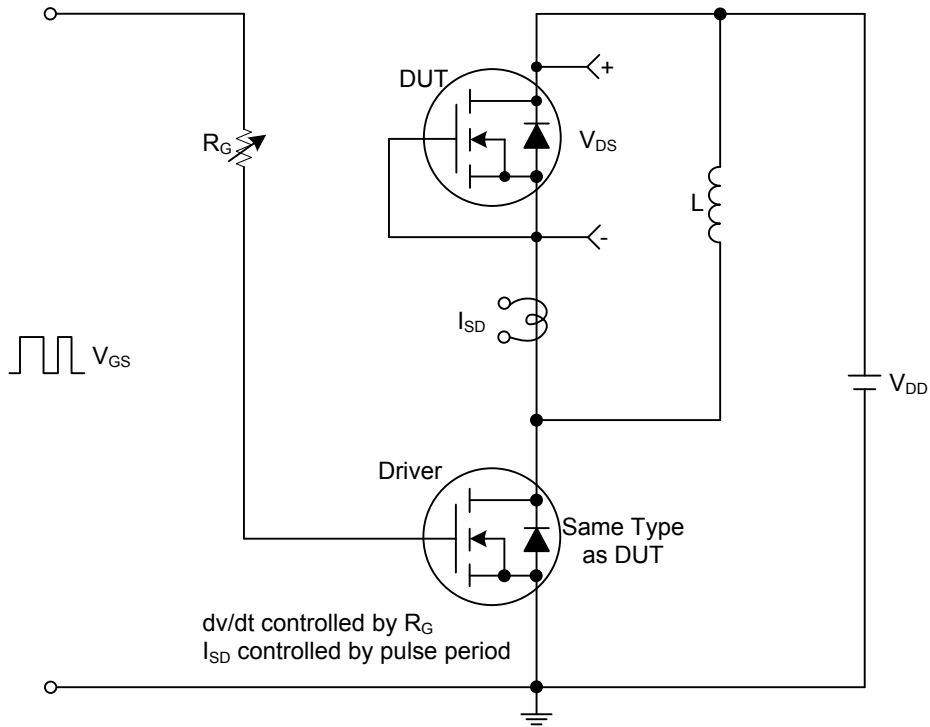
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	steady state	$\theta_{JA}$	62	$^\circ\text{C}/\text{W}$
Junction to Case	steady state	$\theta_{JC}$	0.5	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub> =25°C, unless otherwise specified)

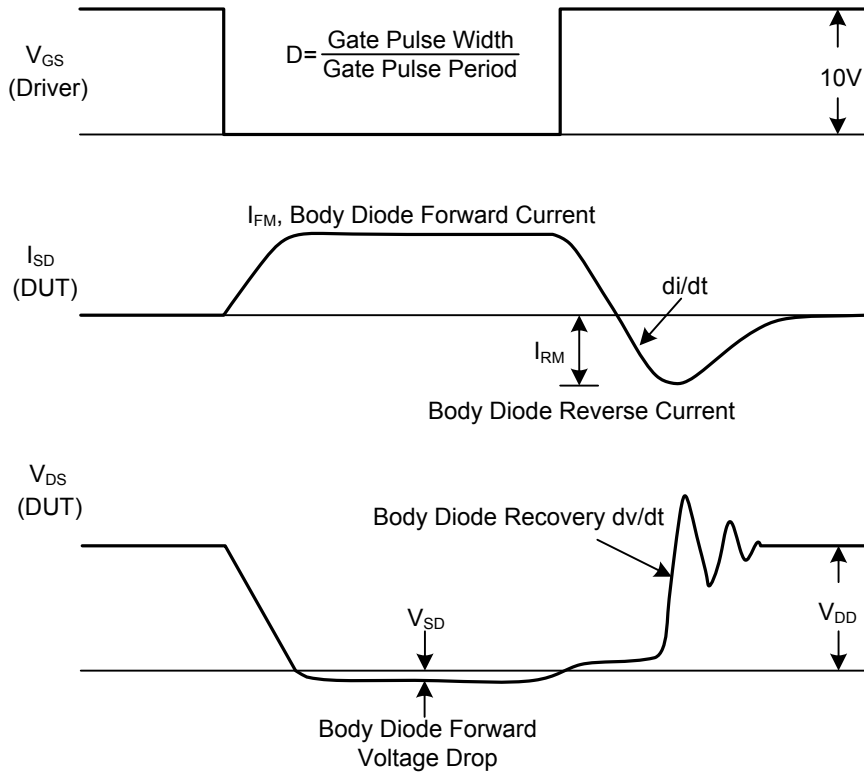
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
<b>OFF CHARACTERISTICS</b>								
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	80			V		
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			1	μA		
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			10	μA		
Gate-Source Leakage Current	Forward	I <sub>GSS</sub>						
	Reverse						V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V	+100
						V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	-100	nA
<b>ON CHARACTERISTICS</b>								
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.5	1.8	2.8	V		
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A			8	mΩ		
<b>DYNAMIC PARAMETERS</b>								
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz		3700		pF		
Output Capacitance	C <sub>OSS</sub>			730		pF		
Reverse Transfer Capacitance	C <sub>RSS</sub>			240		pF		
<b>SWITCHING PARAMETERS</b>								
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =1.3A I <sub>G</sub> =100μA (Note 1, 2)		117		nC		
Gate to Source Charge	Q <sub>GS</sub>			27		nC		
Gate to Drain Charge	Q <sub>GD</sub>			47		nC		
Turn-on Delay Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =30V, I <sub>D</sub> =0.5A, R <sub>G</sub> =25Ω (Note 1, 2)		25		ns		
Rise Time	t <sub>R</sub>			100		ns		
Turn-off Delay Time	t <sub>D(OFF)</sub>			66		ns		
Fall-Time	t <sub>F</sub>			30		ns		
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>								
Maximum Body-Diode Continuous Current	I <sub>S</sub>				70	A		
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>				280	A		
Drain-Source Diode Forward Voltage (Note 1)	V <sub>SD</sub>	I <sub>F</sub> =70A, V <sub>GS</sub> =0V		0.85	1.4	V		
Body Diode Reverse Recovery Time (Note 1)	t <sub>RR</sub>	I <sub>F</sub> =20A, dI <sub>S</sub> /dt=100A/μs		132		ns		
Body Diode Reverse Recovery Charge (Note 1)	Q <sub>RR</sub>			660		nC		

Note: Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Starting T<sub>J</sub>=25°C.

TEST CIRCUITS AND WAVEFORMS



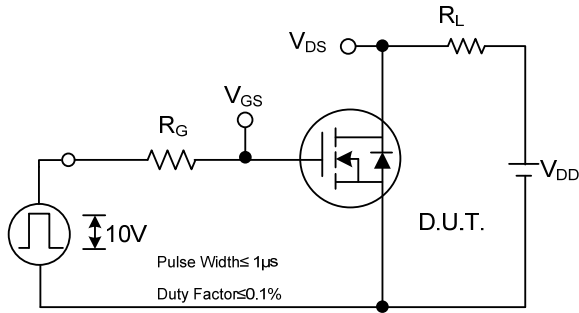
Peak Diode Recovery dv/dt Test Circuit



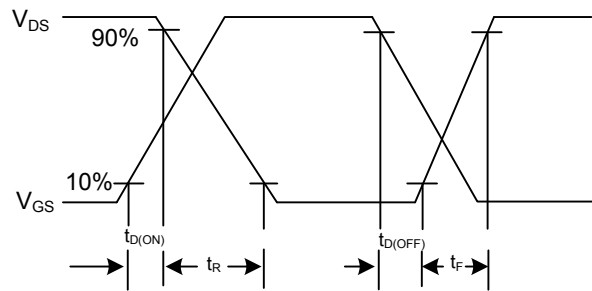
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

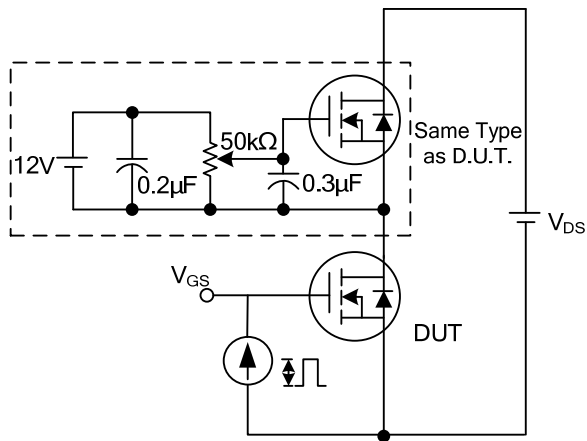
■ TEST CIRCUITS AND WAVEFORMS



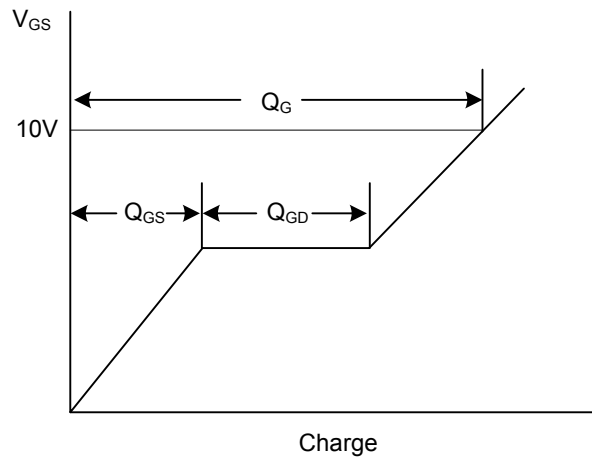
Switching Test Circuit



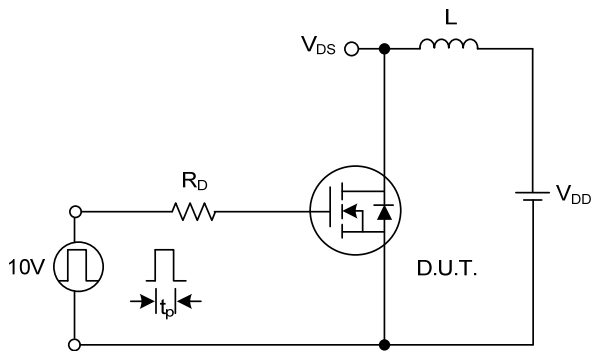
Switching Waveforms



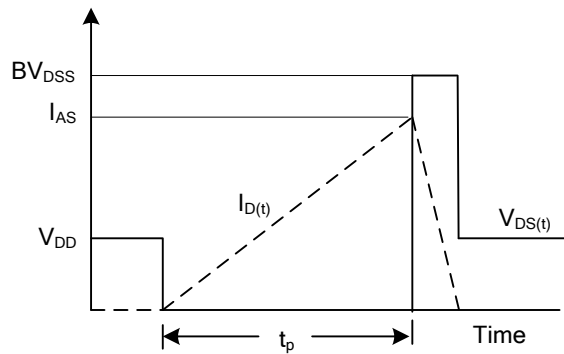
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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