



UNA10R180H

Power MOSFET

42A, 100V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **UNA10R180H** is a N-Channel enhancement MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance and high switching speed.

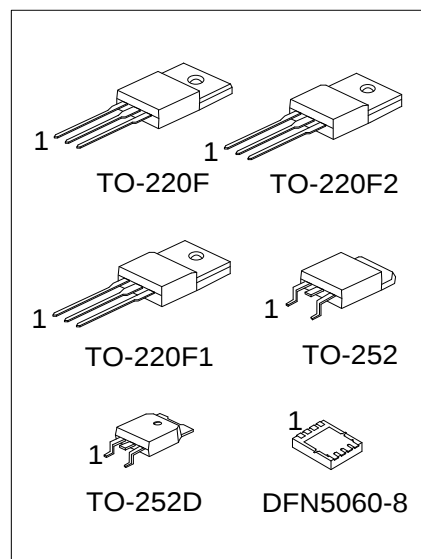
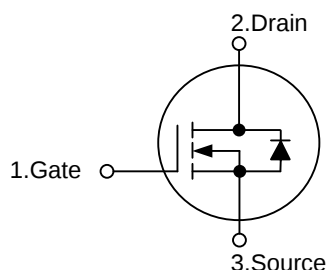
The UTC **UNA10R180H** is suitable for use in a wide variety of applications.

FEATURES

* $R_{DS(ON)} \leq 18 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=33\text{A}$

* High switching speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UNA10R180HL-TF1-T	UNA10R180HG-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
UNA10R180HL-TF2-T	UNA10R180HG-TF2-T	TO-220F2	G	D	S	-	-	-	-	-	Tube
UNA10R180HL-TF3-T	UNA10R180HG-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UNA10R180HL-TN3-R	UNA10R180HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UNA10R180HL-TND-R	UNA10R180HG-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UNA10R180HL-K08-5060-R	UNA10R180HG-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

UNA10R180HG-TF3-T		(1) T: Tube, R: Tape Reel
(1) Packing Type		(2) TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F,
(2) Package Type		TN3: TO-252, TND: TO-252D
(3) Green Package		K08-5060: DFN5060-8
		(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

TO-220F / TO-220F1 / TO-220F2 / TO-252 / TO-252D	DFN5060-8
UTC UNA 10R180H□ □□□□□ Lot Code ← → Date Code L: Lead Free G: Halogen Free 1	UTC UNA 10R180H • □□□□□ Lot Code ← → Date Code

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	100	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	V _{GS} @ 10V, T _C =25°C (Silicon Limited)	I _D	56	A
		V _{GS} @10V, T _C =100°C		39	A
		V _{GS} @ 10V (Package Limited), T _C =25°C		42	A
	Pulsed (Note 2)		I _{DM}	220	A
Single Pulse Avalanche Energy Tested Value (Note 6)			E _{AS} (Tested)	200	mJ
Power Dissipation (T _C =25°C)		TO-220F/TO-220F1 TO-220F2	P _D	30	W
		TO-252/TO-252D		140	W
		DFN5060-8		39	W
Junction Temperature			T _J	-55 ~ +175	°C
Storage Temperature Range			T _{STG}	-55 ~ +175	°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. $L=0.28mH$, $I_{AS}=33A$, $V_{DD}=10V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

4. $I_{SD}\leq 33A$, $di/dt\leq 200A/\mu s$, $V_{DD}\leq BV_{DSS}$, starting $T_J=25^\circ C$

5. Limited by T_{Jmax} , see Test Circuits and Waveforms for typical repetitive avalanche performance.

6. This value determined from sample failure population. 100% tested to this value in production.

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F/TO-220F1	θ_{JA}	62.5	$^\circ C/W$
	TO-220F2			
	TO-252/TO-252D		110	$^\circ C/W$
	DFN5060-8		35	$^\circ C/W$
Junction to Case	TO-220F/TO-220F1	θ_{JC}	4.17	$^\circ C/W$
	TO-220F2			
	TO-252/TO-252D		0.89	$^\circ C/W$
	DFN5060-8		3.2	$^\circ C/W$

Note: The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

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

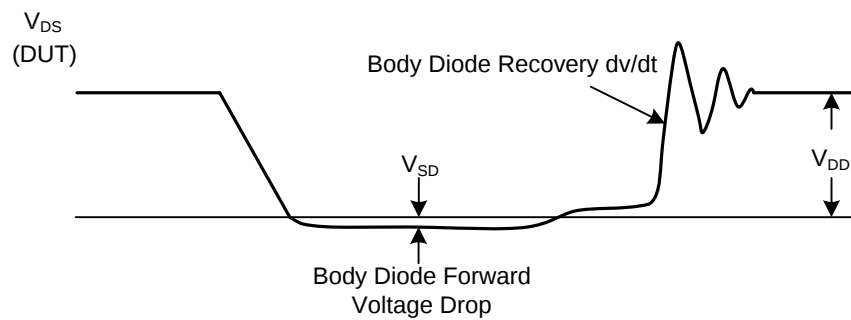
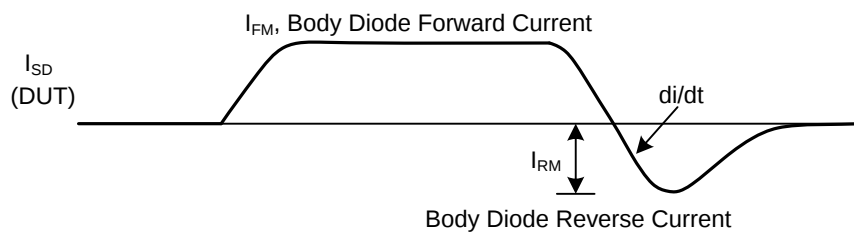
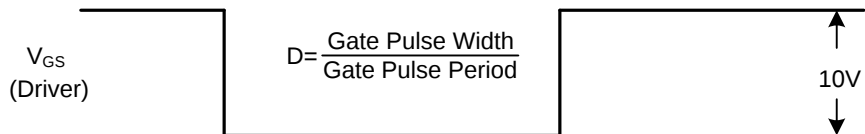
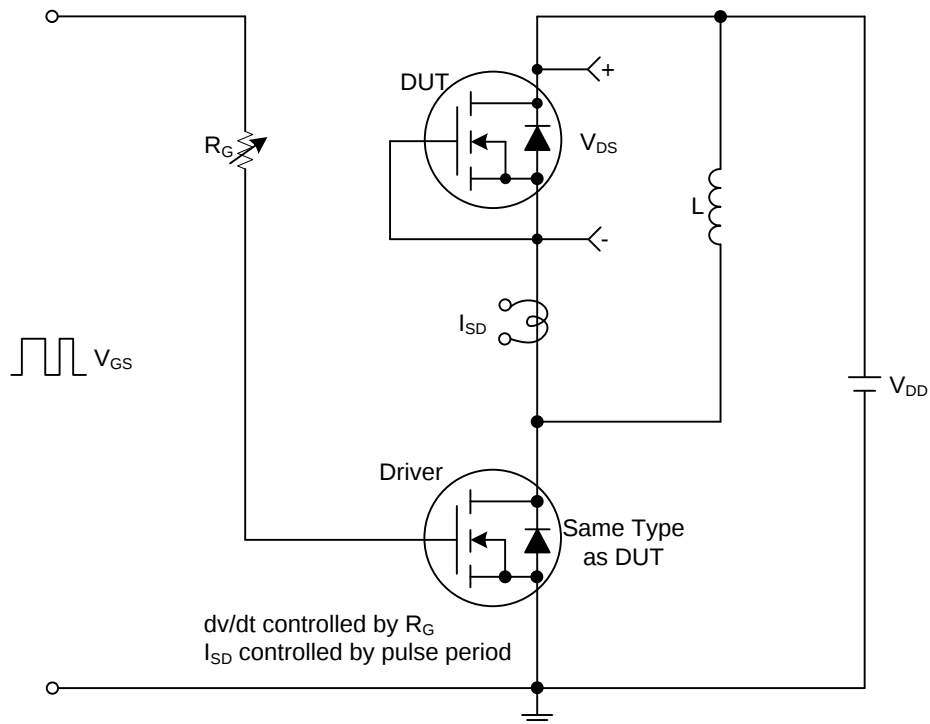
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			20	μA
		V _{DS} =100V, V _{GS} =0V , T _J =125°C			250	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =20V			200	nA
		V _{GS} =-20V			-200	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =33A (Note 2)		15	18	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2930		pF
Output Capacitance	C _{OSS}			290		pF
Reverse Transfer Capacitance	C _{RSS}			180		pF
Output Capacitance	C _{OSS}	V _{GS} =0V, V _{DS} =1.0V, f=1.0MHz		1200		pF
		V _{GS} =0V, V _{DS} =80V, f=1.0MHz		180		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{GS} =10V, V _{DS} =30V, I _D =1A I _G =100μA (Note 2)		69	100	nC
Gate to Source Charge	Q _{GS}			15		nC
Gate-to-Drain ("Miller") Charge	Q _{GD}			25		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =30V, V _{GS} =10V, I _D =6A, R _G =6.8Ω (Note 2)		14		ns
Rise Time	t _R			43		ns
Turn-OFF Delay Time	t _{D(OFF)}			53		ns
Fall-Time	t _F			42		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Source Current (Body Diode)	I _S				56	A
Pulsed Source Current (Body Diode) (Note 1)	I _{SM}				220	A
Diode Forward Voltage	V _{SD}	T _J =25°C, I _S =33A, V _{GS} =0V (Note 2)			1.3	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _S =33A, di/dt=100A/μs, V _{DD} =50V (Note 2)		35	53	ns
Reverse Recovery Charge	Q _{rr}			41	62	nC

Notes: 1. Repetitive rating; pulse width limited by maximum junction temperature.

2. Pulse width ≤1.0ms, duty cycle ≤ 2%.

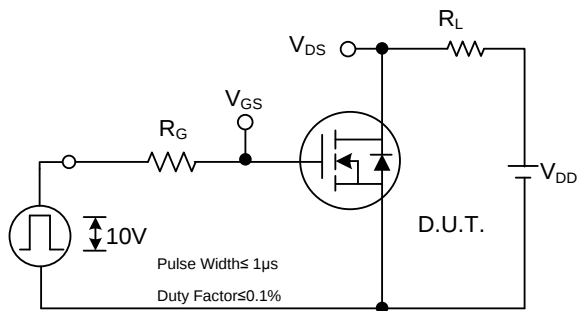
3. C_{OSS} eff. is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 80% V_{DSS}.

■ TEST CIRCUITS AND WAVEFORMS

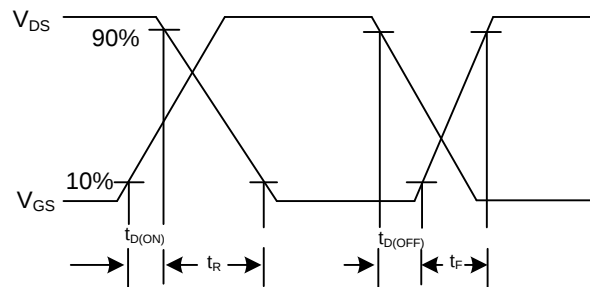


Peak Diode Recovery dV/dt Test Circuit and Waveforms

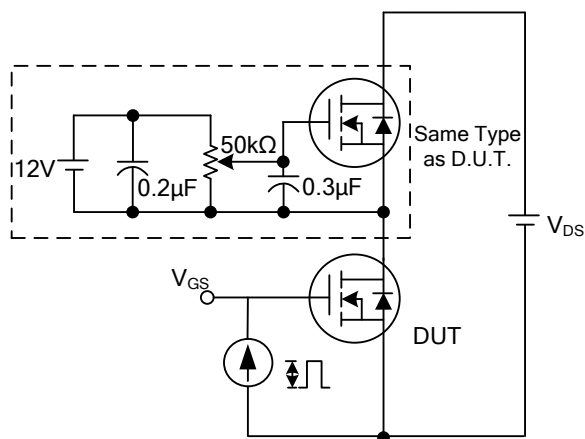
■ TEST CIRCUITS AND WAVEFORMS



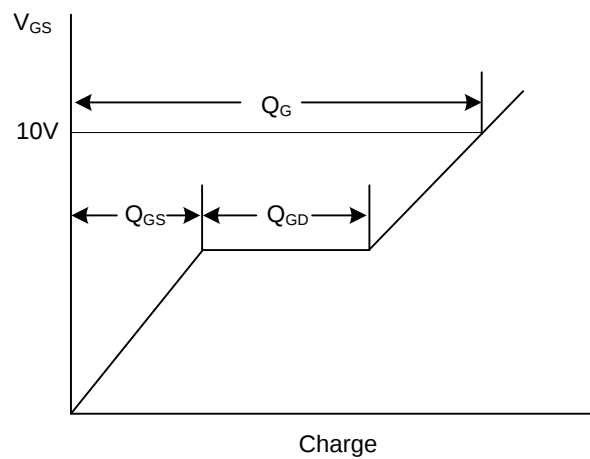
Switching Test Circuit



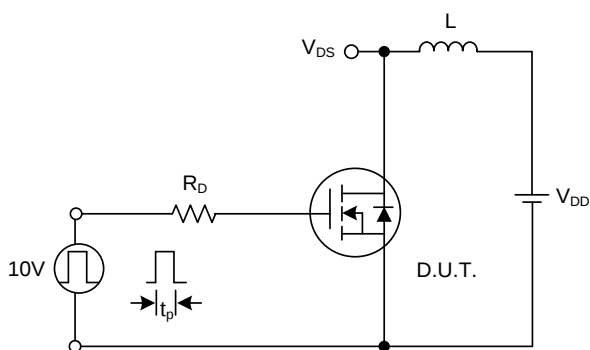
Switching Waveforms



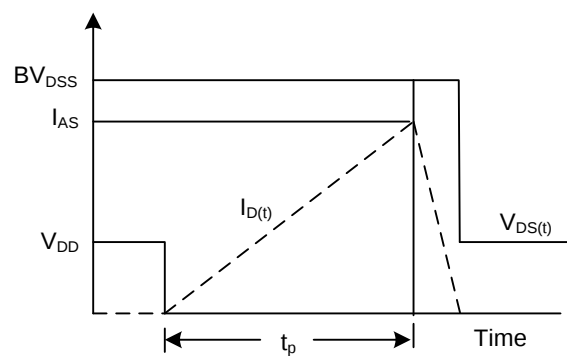
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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