



UNA06R180M

Advance

POWER MOSFET

**35A, 60V N-CHANNEL
ENHANCEMENT MODE
TRENCH POWER MOSFET**

■ DESCRIPTION

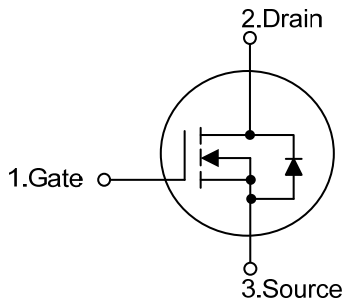
The UTC **UNA06R180M** is an N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low on-state resistance, etc.

The UTC **UNA06R180M** is suitable for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED, etc.

■ FEATURES

- * $R_{DS(ON)} < 18m\Omega @ V_{GS}=10V, I_D=30A$
- * High power and current handling capability
- * High speed switching
- * Low gate charge

■ SYMBOL

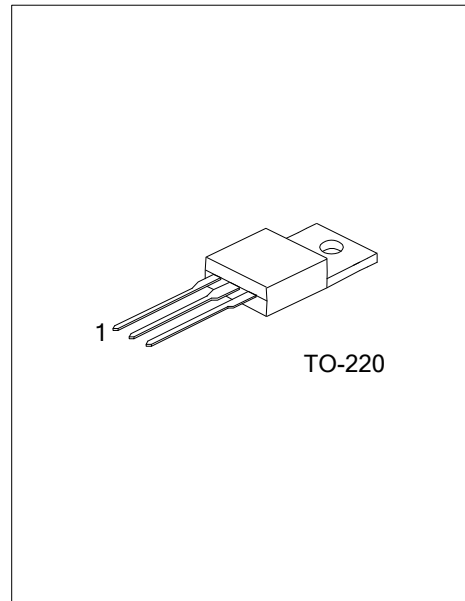


■ ORDERING INFORMATION

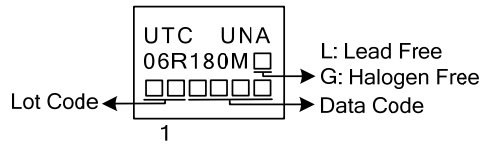
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UNA06R180ML-TA3-T	UNA06R180MG-TA3-T	TO-220	G	D	S	Tube

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

UNA06R180ML-TA3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) TA3: TO-220
	(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}	60	V	
Gate-Source Voltage		V_{GSS}	± 20	V	
Drain Current	Continuous (Note 2)	I_D	$T_C=25^\circ\text{C}$	35	A
			$T_C=100^\circ\text{C}$	27	A
			$T_A=25^\circ\text{C}$	7	A
			$T_A=70^\circ\text{C}$	6	A
	Pulsed(Note 3)		I_{DM}	120	A
Avalanche Current		I_{AS}	26	A	
Avalanche Energy (Note4)		E_{AS}	101	mJ	
Power Dissipation		P_D	$T_C=25^\circ\text{C}$	100	W
			$T_C=100^\circ\text{C}$	50	W
			$T_A=25^\circ\text{C}$	2.1	W
			$T_A=70^\circ\text{C}$	1.3	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. $L=0.3\text{mH}$, $I_{AS}=26\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

5. $I_{SD} \leq 26\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 175^\circ\text{C}$

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to ambient	steady state	θ_{JA}	60	$^\circ\text{C}/\text{W}$
Junction to Case	steady state	θ_{JC}	1.5	$^\circ\text{C}/\text{W}$

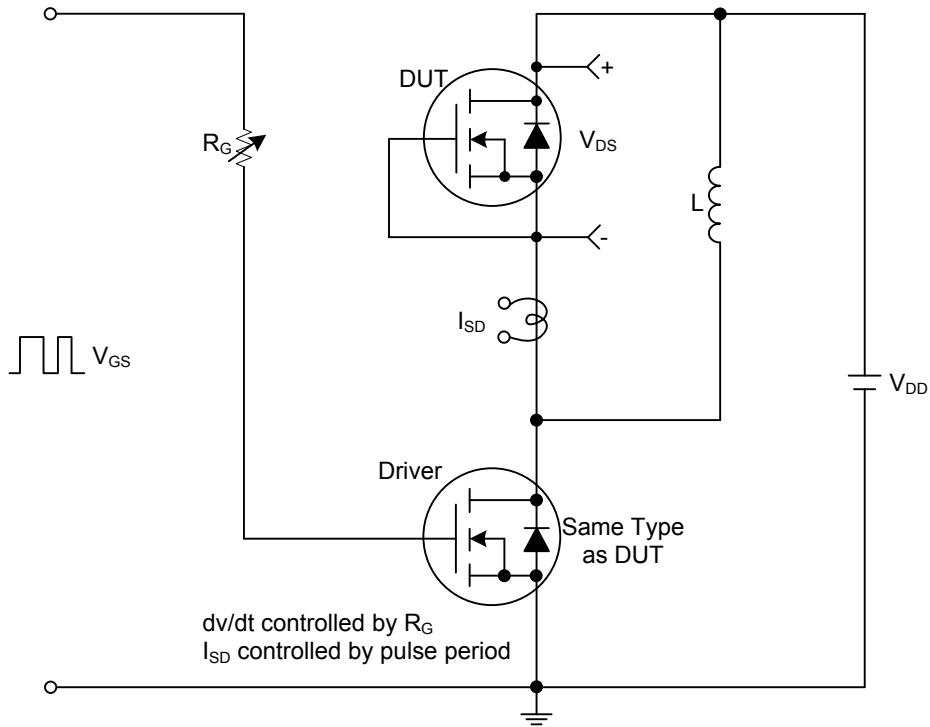
■ ELECTRICAL CHARACTERISTICS (T_A =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
		V _{DS} =60V, T _J =55°C			5	μA
Gate-Source Leakage Current	Forward	I _{GSS}				
	Reverse					
		V _{GS} =+20V, V _{DS} =0V			+100	nA
		V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Static Drain-Source On-State Resistance (Note 1)	R _{DS(ON)}	V _{GS} =10V, I _D =30A		15	18	mΩ
Forward Transconductance(Note 1)	g _{FS}	V _{DD} =5V, I _D =30A		50		S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =30V, f=1.0MHz		1840		pF
Output Capacitance	C _{OSS}			185		pF
Reverse Transfer Capacitance	C _{RSS}			80		pF
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz		3	5	Ω
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =50V, V _{GS} =10V, I _D =1.3A (Note 1, 2)		27.5		nC
Gate to Source Charge	Q _{GS}			10		nC
Gate to Drain Charge	Q _{GD}			6.5		nC
Turn-on Delay Time	t _{D(ON)}	V _{DD} =30V, I _D =0.5A, R _G =25Ω (Note 1, 2)		12		ns
Rise Time	t _R			5.2		ns
Turn-off Delay Time	t _{D(OFF)}			38		ns
Fall-Time	t _F			27		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S	Integral p-n diode in MOSFET			35	A
Maximum Body-Diode Pulsed Current	I _{SM}				140	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V		0.75	1.0	V
Body Diode Reverse Recovery Time	t _{RR}	I _S =30A, dI _S /dt=100A/μs		35		ns
Body Diode Reverse Recovery Charge	Q _{RR}				47	

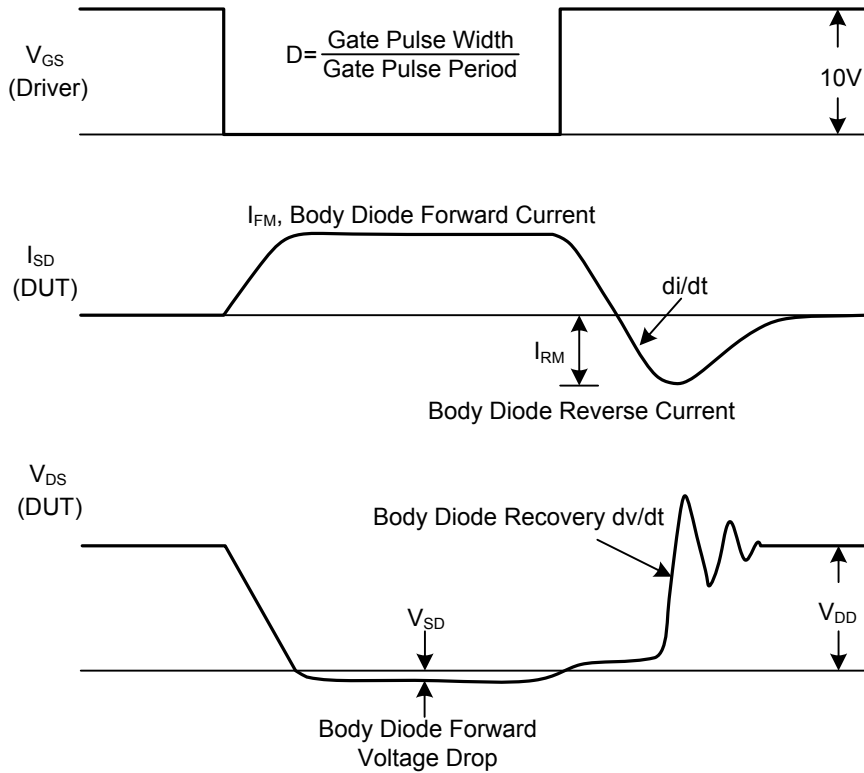
Notes: 1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS



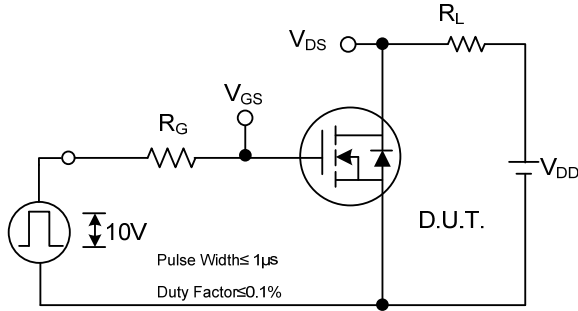
Peak Diode Recovery dv/dt Test Circuit



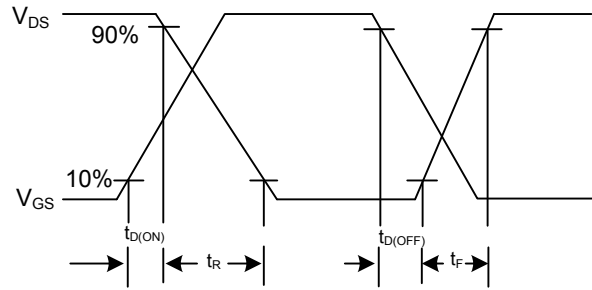
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

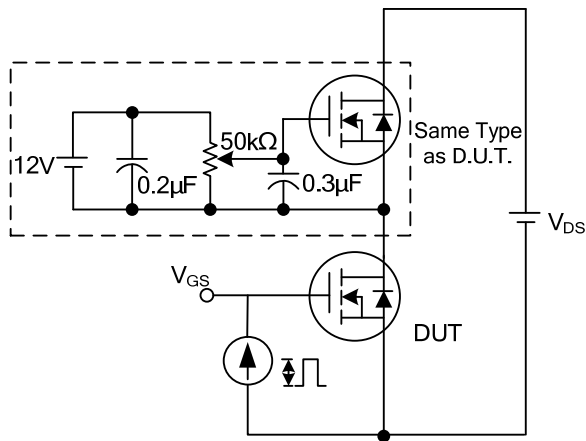
TEST CIRCUITS AND WAVEFORMS



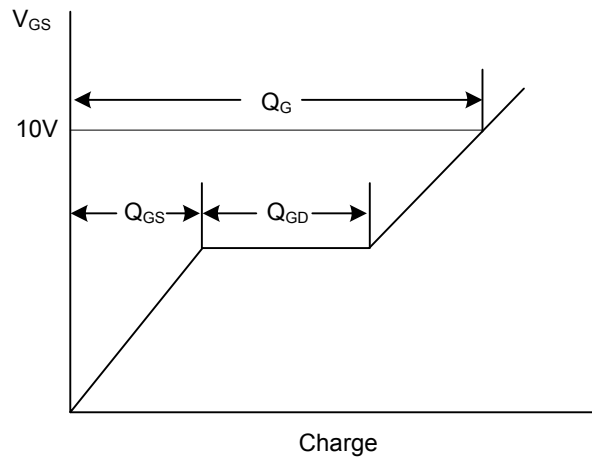
Switching Test Circuit



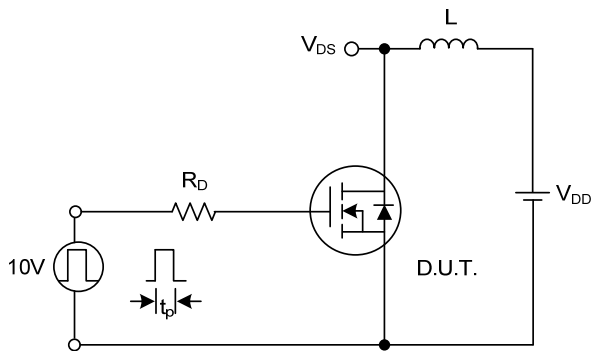
Switching Waveforms



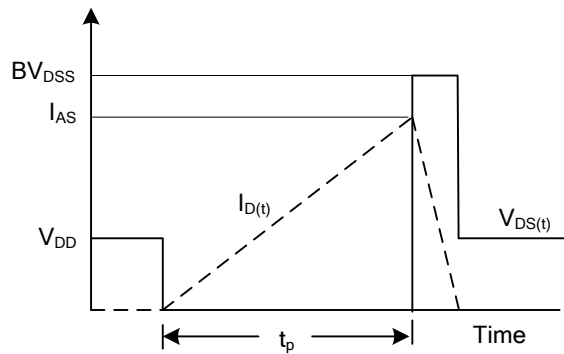
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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