



15N06

Power MOSFET

15A, 60V N-CHANNEL POWER MOSFET

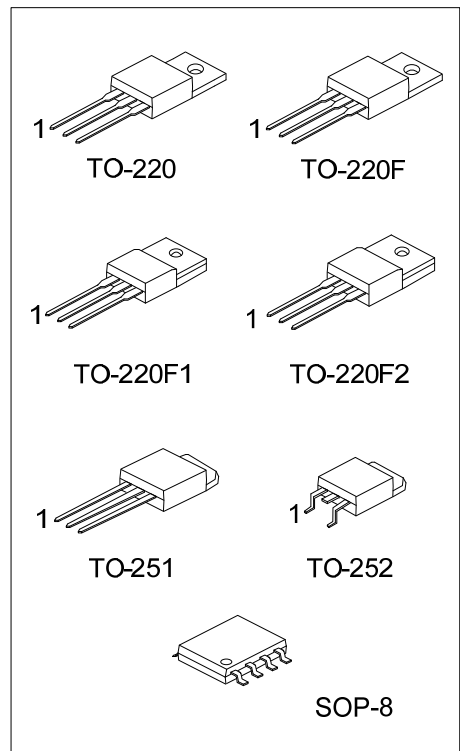
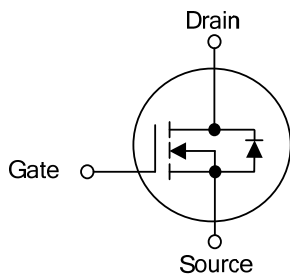
■ DESCRIPTION

The UTC **15N06** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

- * $R_{DS(ON)} \leq 100 \text{ m}\Omega @ V_{GS}=10\text{V}, I_D=7.5\text{A}$
- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified

■ SYMBOL



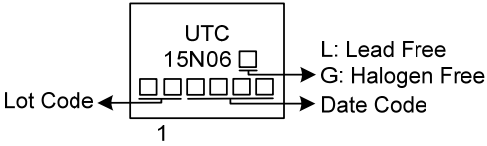
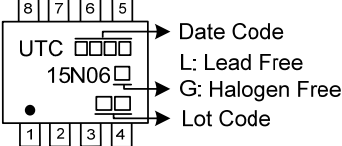
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing	
Lead Free	Halogen Free		1	2	3	4	5	6	7	8		
15N06L-TA3-T	15N06G-TA3-T	TO-220	G	D	S	-	-	-	-	-	-	Tube
15N06L-TF1-T	15N06G-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	-	Tube
15N06L-TF2-T	15N06G-TF2-T	TO-220F2	G	D	S	-	-	-	-	-	-	Tube
15N06L-TF3-T	15N06G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	-	Tube
15N06L-TM3-T	15N06G-TM3-T	TO-251	G	D	S	-	-	-	-	-	-	Tube
15N06L-TN3-R	15N06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	-	Tape Reel
15N06L-S08-R	15N06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	D	Tape Reel

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

<p>15N06G-TA3-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1, TF2: TO-220F2, TM3: TO-251, TN3: TO-252 S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING

TO-220 / TO-220F / TO-220F1 TO-220F2 / TO-251 / TO-252	SOP-8
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Drain-Gate Voltage ($R_G=20k\Omega$)		V_{DGR}	60	V
Gate-Source Voltage		V_{GSS}	± 15	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)		I_D	15	A
Pulsed Drain Current (Note 2)		I_{DM}	60	A
Avalanche Current (Note 3)		I_{AR}	15	A
Avalanche Energy	Single Pulsed (Note 4)	E_{AS}	50	mJ
	Repetitive (Note 3)	E_{AR}	12	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220	P_D	62.5	W
	TO-220F/TO-220F1		34	W
	TO-220F2			
	TO-251/TO-252		62.5	W
	SOP-8		5.6	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-65 ~ +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. Pulse width limited by safe operating area.
3. Pulse width limited by $T_{J(MAX)}$, $\delta < 1\%$
4. Starting $T_J=25^\circ\text{C}$, $I_D=I_{AR}$, $V_{DD}=25\text{V}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-220F1/TO-220F2			
	TO-251/TO-252		90(Note)	$^\circ\text{C/W}$
	SOP-8		125(Note)	$^\circ\text{C/W}$
Junction to Case	TO-220	θ_{JC}	2	$^\circ\text{C/W}$
	TO-220F/TO-220F1		3.67	$^\circ\text{C/W}$
	TO-220F2			
	TO-251/TO-252		2 (Note)	$^\circ\text{C/W}$
	SOP-8		22 (Note)	$^\circ\text{C/W}$

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

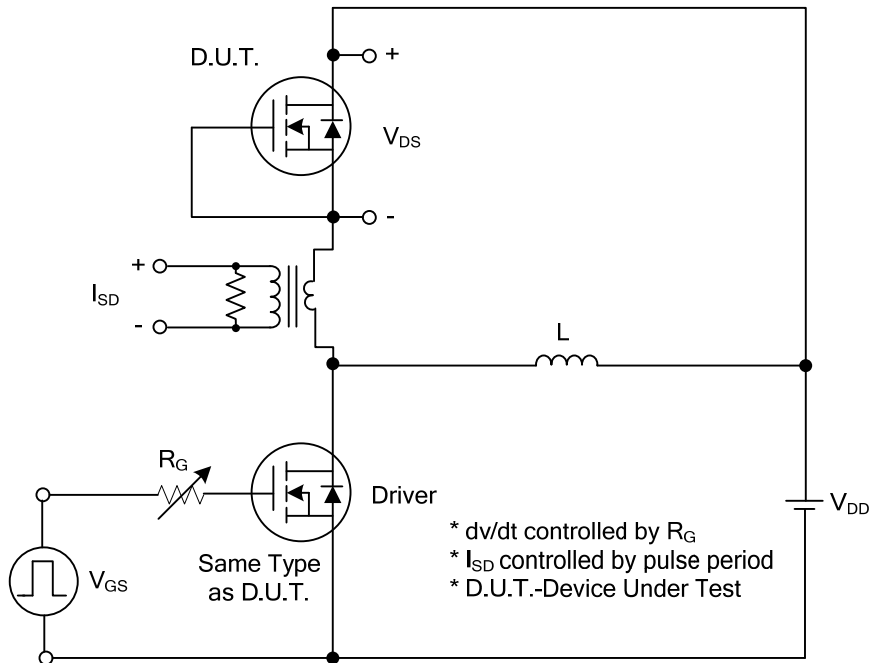
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	60			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =Max Rating			250	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±15V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250 μA	1	1.6	2.5	V
On State Drain Current	I _{D(ON)}	V _{DS} >I _{D(ON)} ×R _{DS(ON)MAX} , V _{GS} =10V	15			A
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =5V, I _D =7.5A		75	100	mΩ
Forward Transconductance (Note 1)	g _{FS}	V _{DS} >I _{D(ON)} ×R _{DS(ON)MAX} , I _D =7.5A	3	5		S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1MHz		347	950	pF
Output Capacitance	C _{OSS}			136	310	pF
Reverse Transfer Capacitance	C _{RSS}			19	110	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DD} =40V, V _{GS} =5V, I _D =15A		10	30	nC
Gate Source Charge	Q _{GS}			5		
Gate Drain Charge	Q _{GD}			3		
Turn-ON Delay Time	t _{D(ON)}	V _{GS} =5V, V _{DD} =30V, R _G =4.7Ω, I _D =7.5A		10.5	60	ns
Turn-ON Rise Time	t _R			16.8	200	
Turn-OFF Delay Time	t _{D(OFF)}	V _{GS} =10V, V _{DD} =48V, R _G =47Ω, I _D =15A		63.7	80	ns
Turn-OFF Fall-Time	t _F			24.1	140	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				15	A
Maximum Body-Diode Pulsed Current	I _{SM}				60	A
Diode Forward Voltage	V _{SD}	I _{SD} =15A, V _{GS} =0V(Note 1)			1.5	V
Reverse Recovery Time (Note 1)	t _{rr}	I _S =10A, V _{GS} =0V, dI _F /dt =100A/μs		36		ns
Reverse Recovery Charge	Q _{rr}				98	

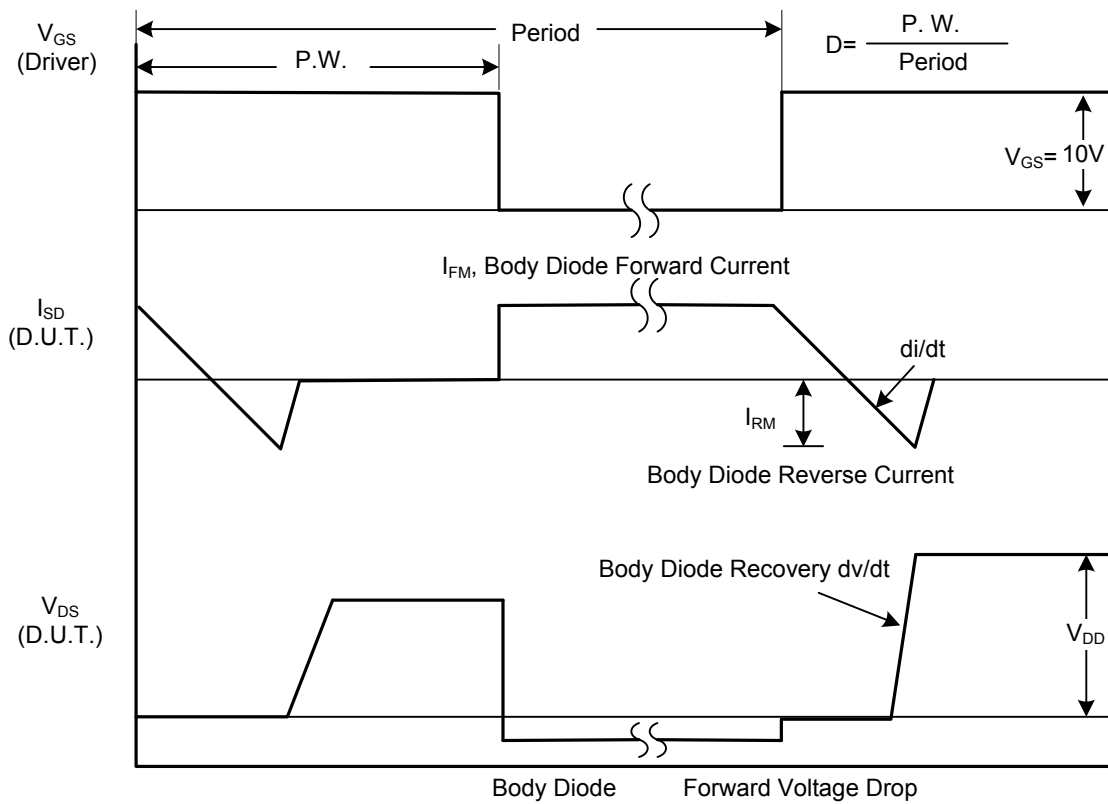
Notes: 1. Pulse width=300μs, duty cycle=1.5%

2. Pulse width limited by safe operating area.

■ TEST CIRCUITS AND WAVEFORMS

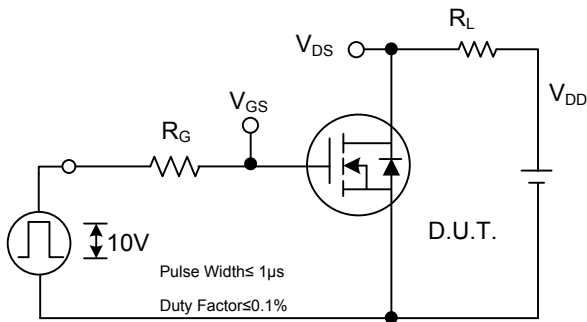


Peak Diode Recovery dv/dt Test Circuit

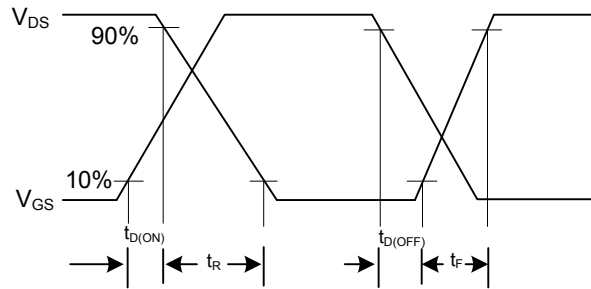


Peak Diode Recovery dv/dt Waveforms

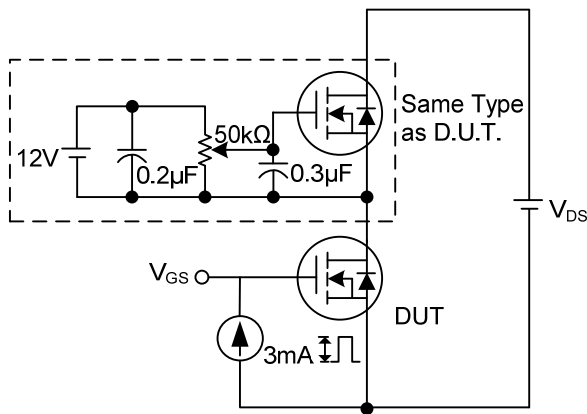
TEST CIRCUITS AND WAVEFORMS



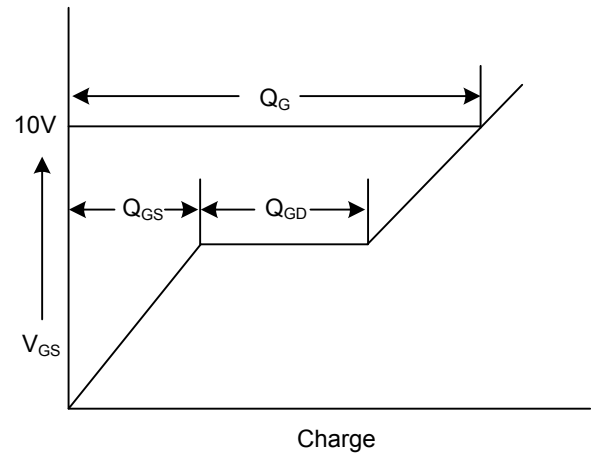
Switching Test Circuit



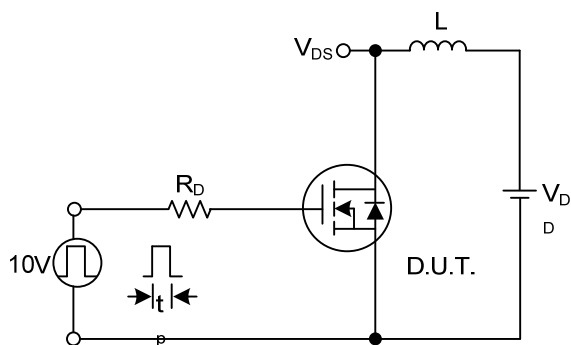
Switching Waveforms



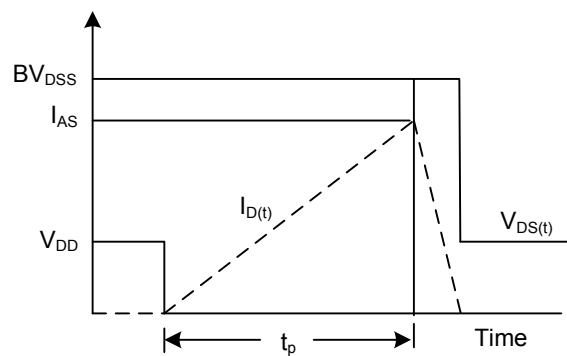
Gate Charge Test Circuit



Gate Charge Waveform

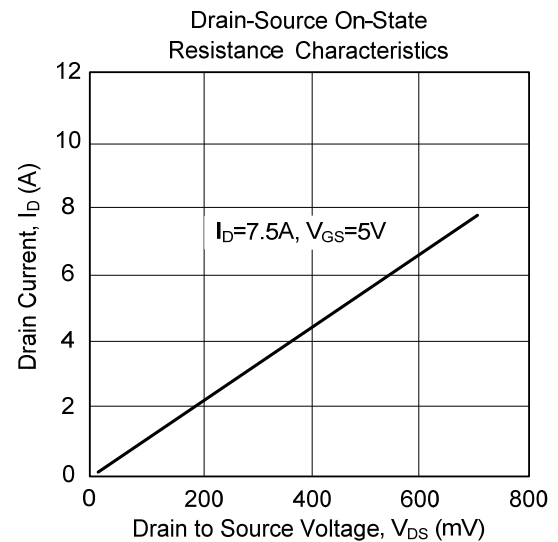
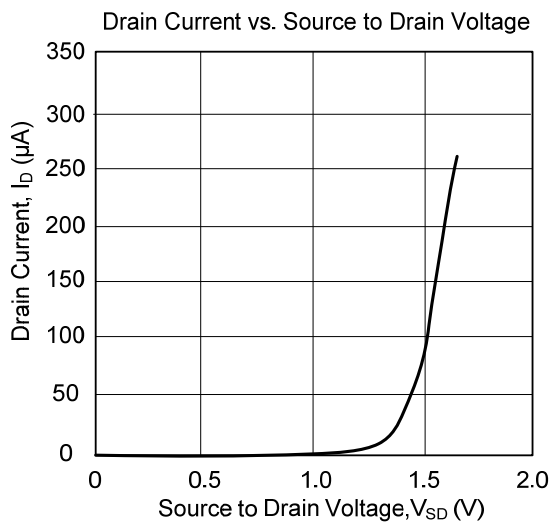
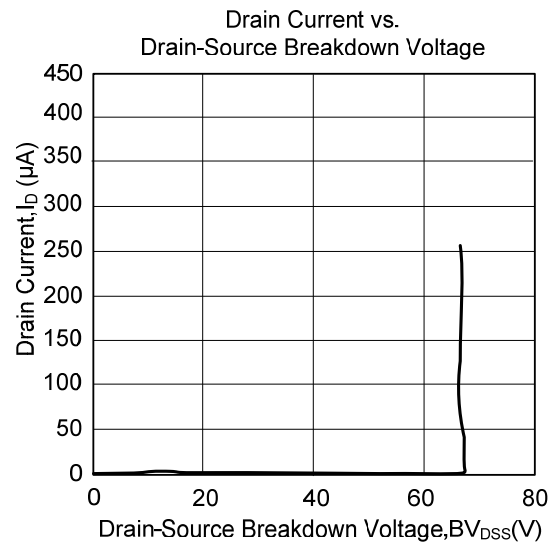
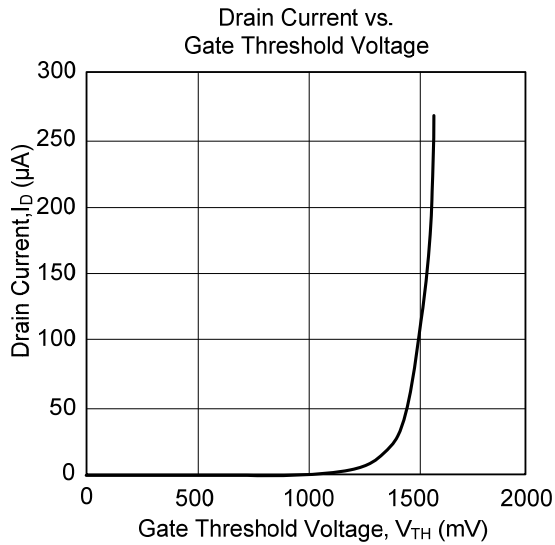


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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