



15N06

Power MOSFET

15A, 60V N-CHANNEL POWER MOSFET

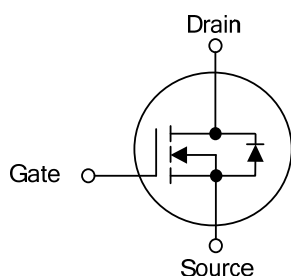
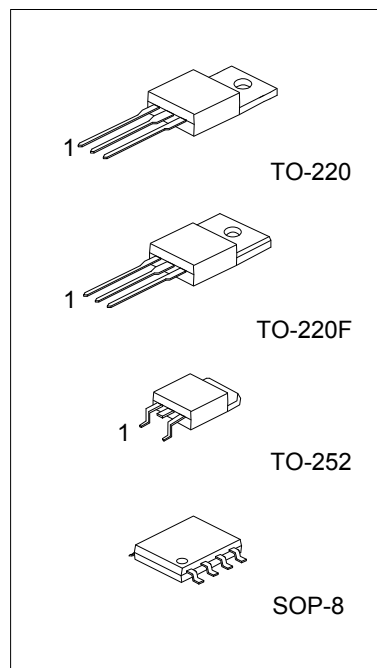
DESCRIPTION

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

- * $R_{DS(ON)} < 100m\Omega$ @ $V_{GS}=5V$, $I_D=7.5A$
- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified

SYMBOL

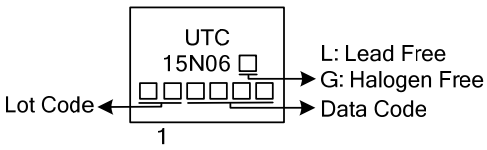
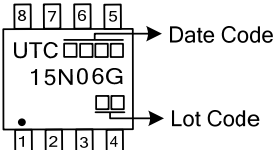


ORDERING INFORMATION

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-TF3-T	15N06G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
15N06L-TN3-R	15N06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
-	15N06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

	(1) R: Tape Reel, T: Tube
	(2) TA3: TO-220, TF3: TO-220F, TN3: TO-252 S08: SOP-8
	(3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING

TO-220 / TO-220F / TO-252	SOP-8
 <p>UTC 15N06</p> <p>Lot Code →</p> <p>→ Data Code</p> <p>1</p> <p>L: Lead Free G: Halogen Free Data Code</p>	 <p>UTC 15N06G</p> <p>→ Date Code</p> <p>→ Lot Code</p> <p>1 2 3 4 5 6 7 8</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Drain-Gate Voltage ($R_G=20\text{k}\Omega$)		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 ($T_A=25^\circ\text{C}$)	TO-220	P_D	2.2	W
	TO-220F		2.0	
	TO-252		1.5	
	SOP-8		2.0	
Junction Temperature		T_J	+175	$^\circ\text{C}$
Storage Temperature		T_{STG}	-65 ~ +175	$^\circ\text{C}$

Note: 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/SOP-8	θ_{JA}	58	$^\circ\text{C/W}$
	TO-220F		62.5	
	TO-252		100	
Junction to Case	TO-220	θ_{JC}	4.38	$^\circ\text{C/W}$
	TO-220F		5	
	TO-252		3	

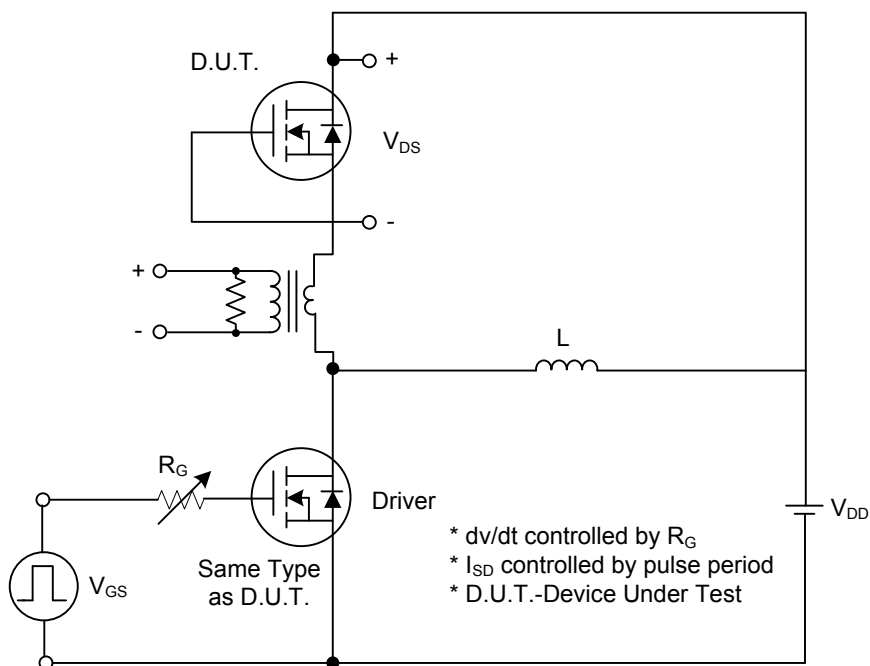
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	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	1.7	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		700	950	pF
Output Capacitance	C _{OSS}			230	310	pF
Reverse Transfer Capacitance	C _{RSS}			80	110	pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	t _{D(ON)}	V _{GS} =5V, V _{DD} =30V, R _G =4.7Ω, I _D =7.5A		15	60	ns
Turn-ON Rise Time	t _R			160	200	
Turn-OFF Delay Time	t _{D(OFF)}	V _{GS} =10V, V _{DD} =48V, R _G =47Ω, I _D =15A		52	80	ns
Turn-OFF Fall-Time	t _F			100	140	
Total Gate Charge	Q _G	V _{DD} =40V, V _{GS} =5V, I _D =15A		18	30	nC
Gate Source Charge	Q _{GS}			8		
Gate Drain Charge	Q _{GD}			9		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V _{SD}	I _{SD} =15 A,V _{GS} =0V(Note 1)			1.5	V
Source-Drain Current	I _{SD}				15	A
Source-Drain Current (Pulse)	I _{SDM}	(Note 2)			60	A

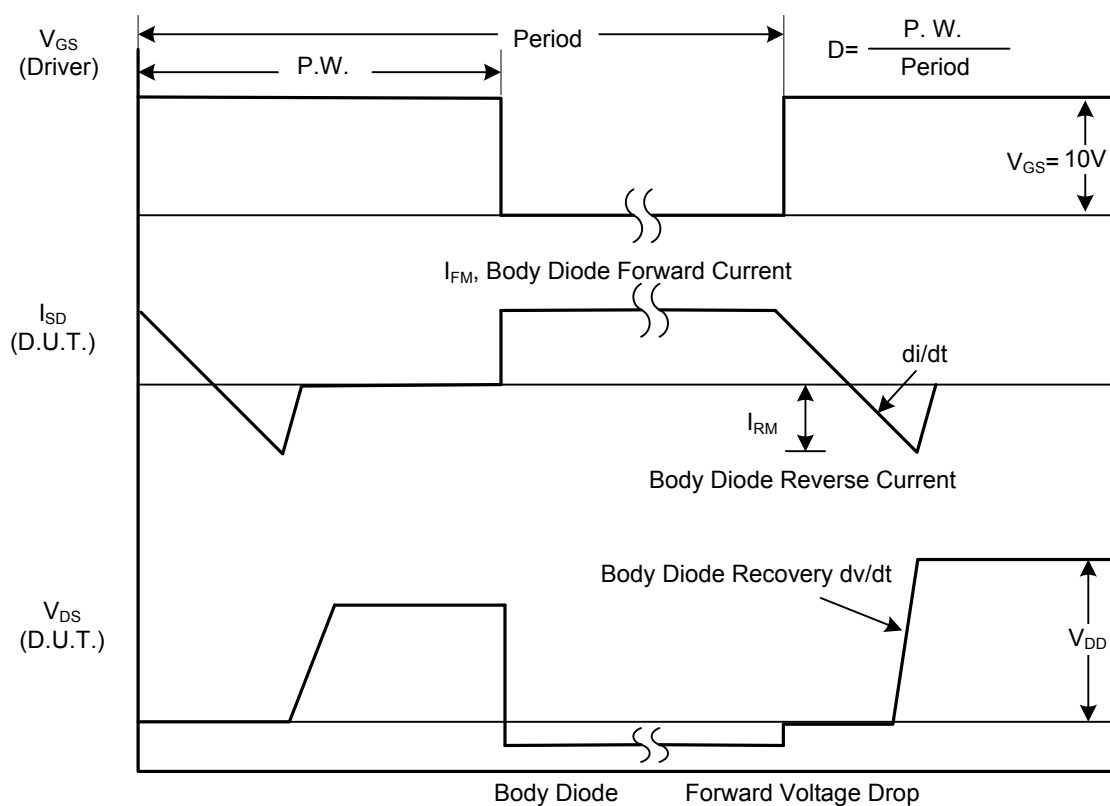
Notes: 1. Pulse width=300 μs , duty cycle=1.5%

2. Pulse width limited by safe operating area.

■ TEST CIRCUITS AND WAVEFORMS

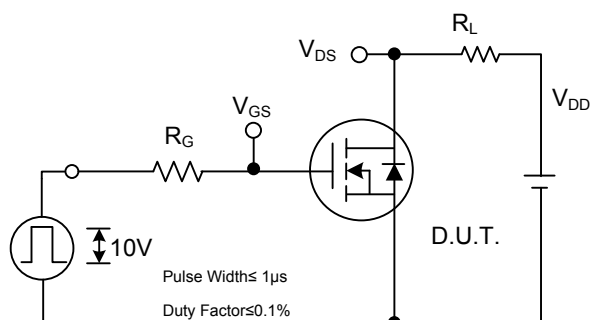


Peak Diode Recovery dv/dt Test Circuit

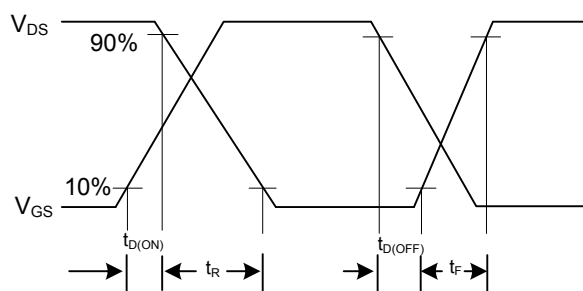


Peak Diode Recovery dv/dt Waveforms

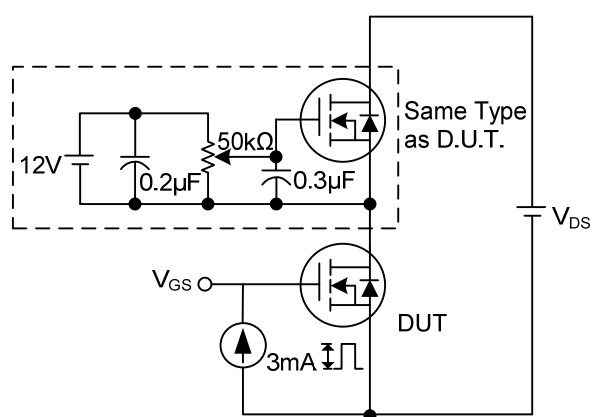
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



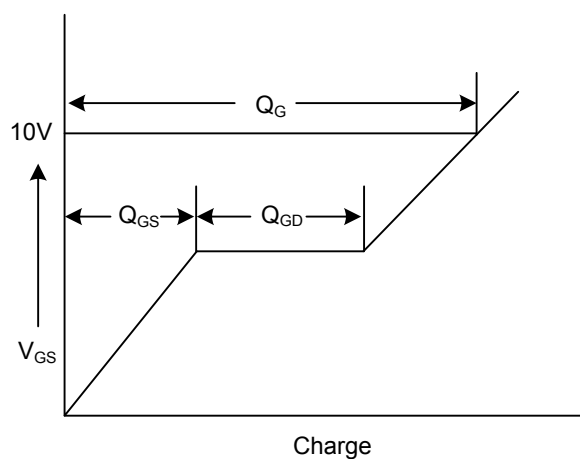
Switching Test Circuit



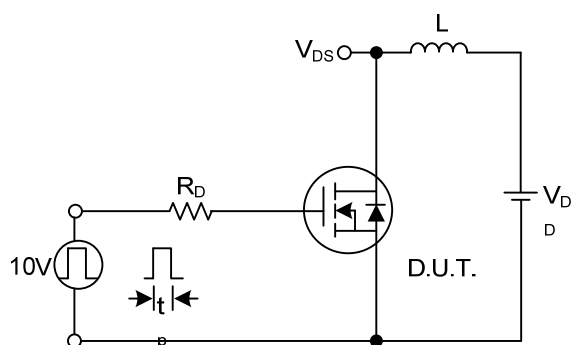
Switching Waveforms



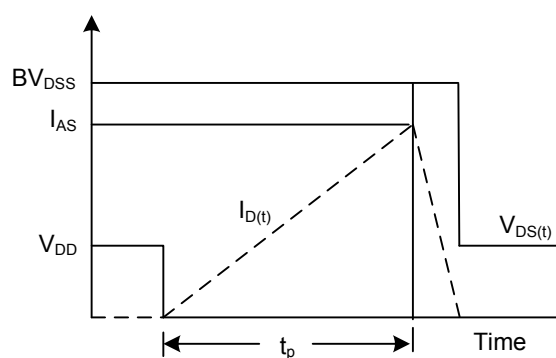
Gate Charge Test Circuit



Gate Charge Waveform

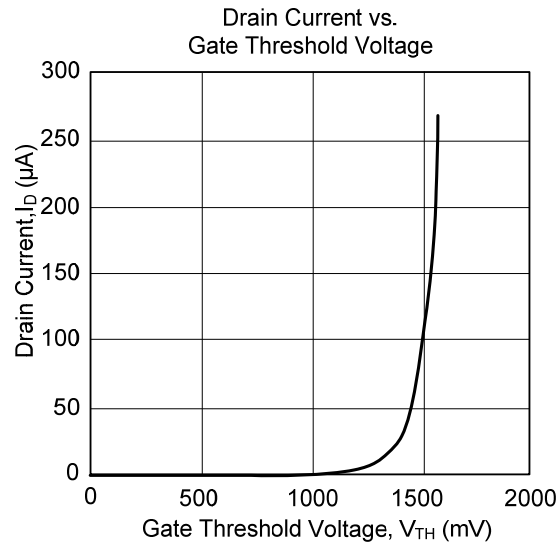
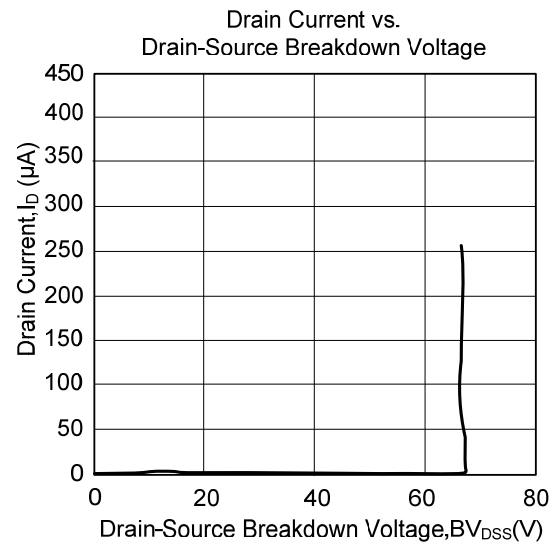
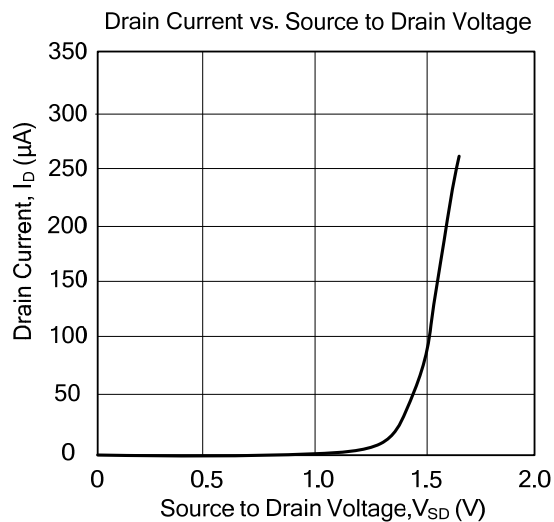
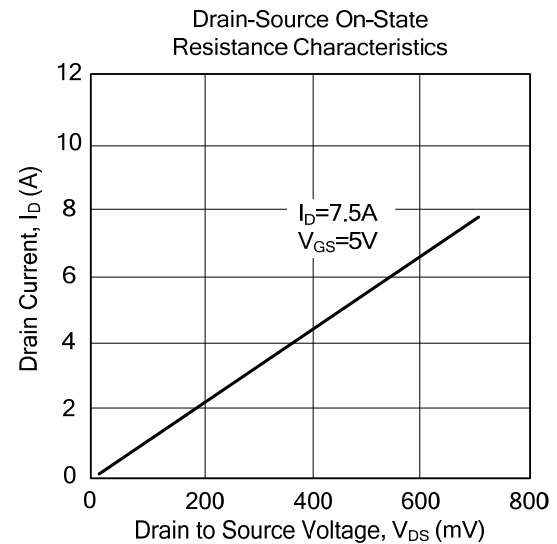


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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