



15N06

Power MOSFET

N -CHANNEL ENHANCEMENT MODE LOW THRESHOLD POWER MOS TRANSISTOR

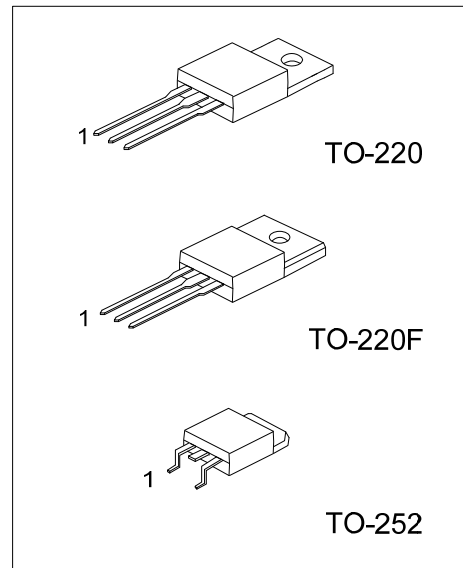
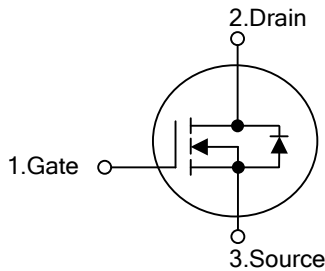
DESCRIPTION

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	
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

<p>15N06L-TA3-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) TA3: TO-220, TF3: TO-220F, TN3: TO-252 (3) G: Halogen Free, L: Lead Free</p>
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■ ABSOLUTE MAXIMUM RATINGS (Ta=25°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 ($T_C=25^\circ C$)		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 (Ta=25°C)	TO-220	P_D	2.2	W
	TO-220F		2.0	W
	TO-252		1.5	W
Junction Temperature		T_J	+175	°C
Storage Temperature		T_{STG}	-65 ~ +175	°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 $T_J=25^\circ C$, $I_D=I_{AR}$, $V_{DD}=25V$

■ THERMAL DATA

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient	TO-220	θ_{JA}			58	°C/W
	TO-220F				62	°C/W
	TO-252				100	°C/W
Junction to Case	TO-220	θ_{JC}			4.38	°C/W
	TO-220F				5	°C/W
	TO-252				3	°C/W

■ 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}	$V_{GS}=0V$, $I_D=250\mu A$	60			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=\text{Max Rating}$			250	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V$, $V_{GS}=\pm 15V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1	1.7	2.5	V
On State Drain Current	$I_{D(ON)}$	$V_{DS}>I_{D(ON)}\times R_{DS(ON)MAX}$, $V_{GS}=10V$	15			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=5V$, $I_D=7.5A$		75	100	m Ω
Forward Transconductance (Note 1)	g_{FS}	$V_{DS}>I_{D(ON)}\times R_{DS(ON)MAX}$, $I_D=7.5A$	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						
Total Gate Charge	Q_G	$V_{DD}=40V$, $V_{GS}=5V$, $I_D=15A$		18	30	nC
Gate Source Charge	Q_{GS}			8		nC
Gate Drain Charge	Q_{GD}			9		nC
Turn-ON Delay Time	$t_{D(ON)}$	$V_{GS}=5V$, $V_{DD}=30V$, $R_G=4.7\Omega$, $I_D=7.5A$		15	60	ns
Turn-ON Rise Time	t_R			160	200	ns
Turn-OFF Delay Time	$t_{D(OFF)}$	$V_{GS}=10V$, $V_{DD}=48V$, $R_G=47\Omega$, $I_D=15A$		52	80	ns
Turn-OFF Fall-Time	t_F			100	140	ns

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	$I_{SD}=15\text{ A}, V_{GS}=0\text{V}$ (Note 1)			1.5	V
Source-Drain Current	I_{SD}				15	A
Source-Drain Current (Pulse)	I_{SDM}	(Note 2)			60	A

Note: 1. Pulse width=300 μ s, duty cycle=1.5%

2. Pulse width limited by safe operating area

■ TEST CIRCUITS AND WAVEFORMS

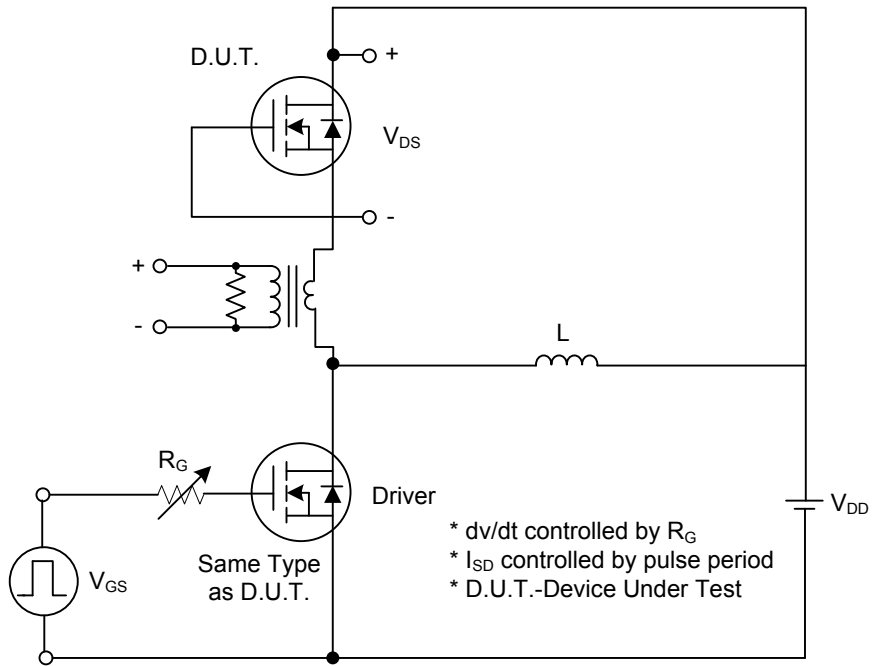


Fig. 1A Peak Diode Recovery dv/dt Test Circuit

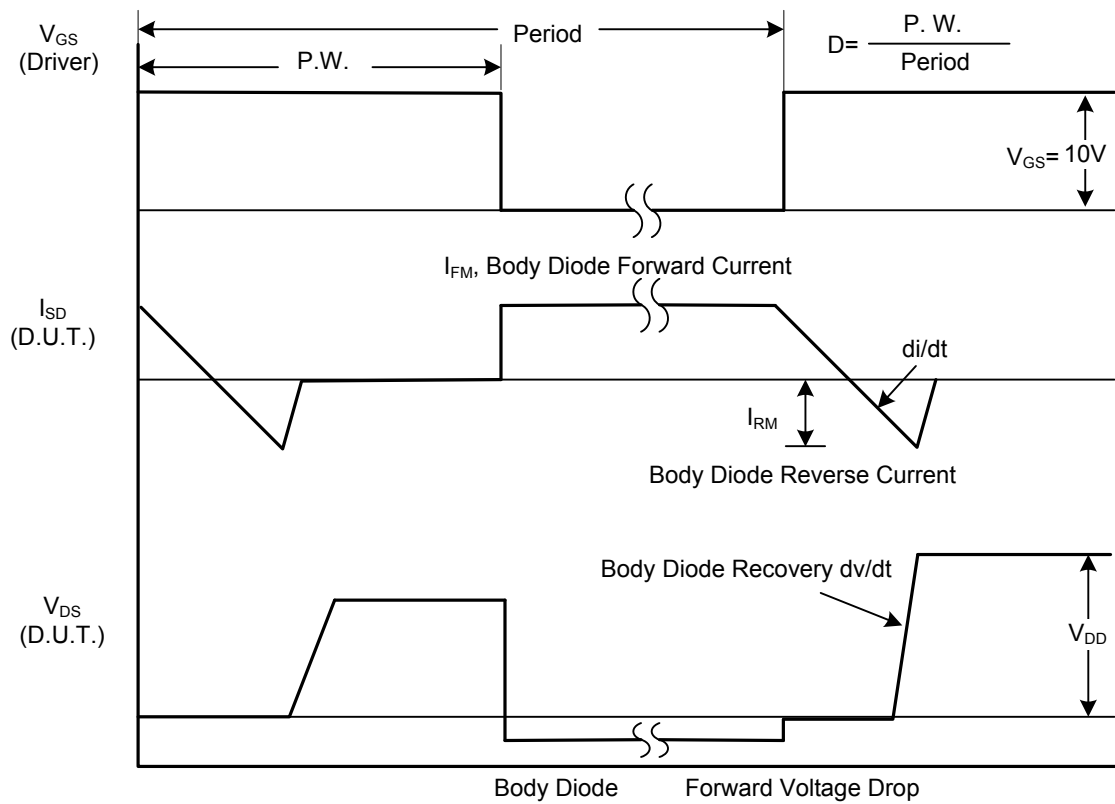


Fig. 1B Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

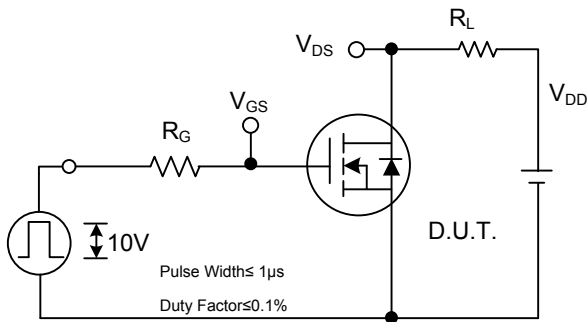


Fig. 2A Switching Test Circuit

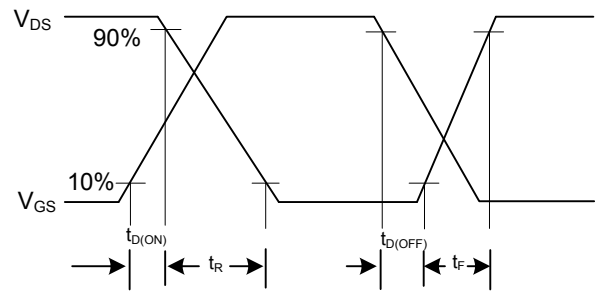


Fig. 2B Switching Waveforms

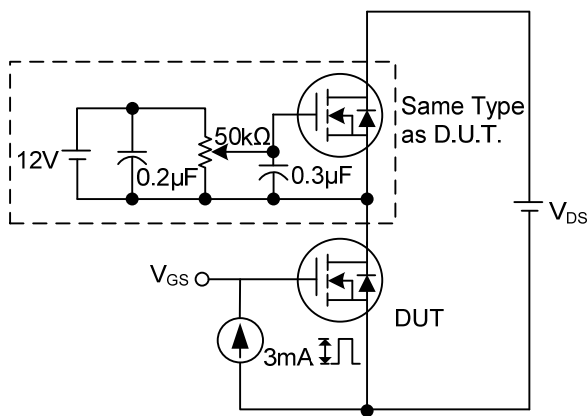


Fig. 3A Gate Charge Test Circuit

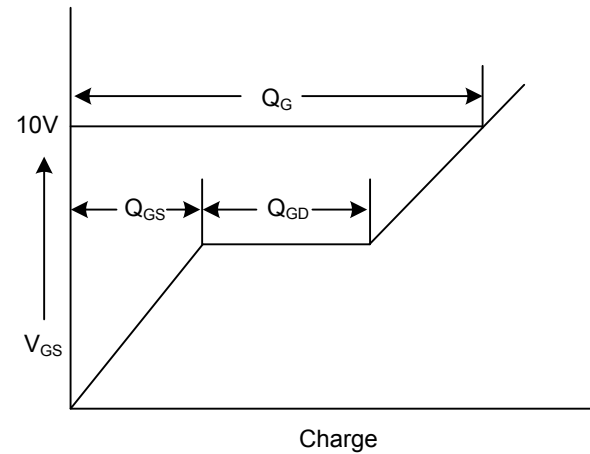


Fig. 3B Gate Charge Waveform

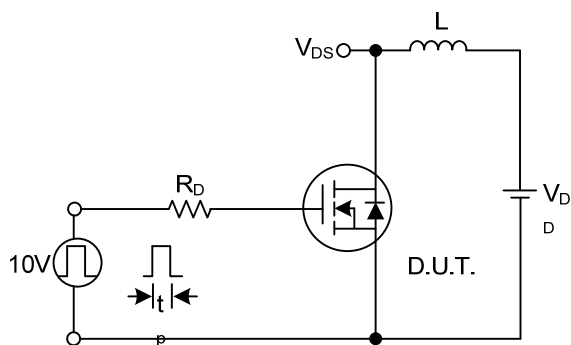


Fig. 4A Unclamped Inductive Switching Test Circuit

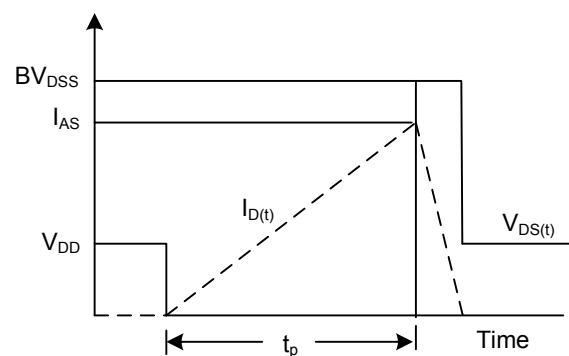
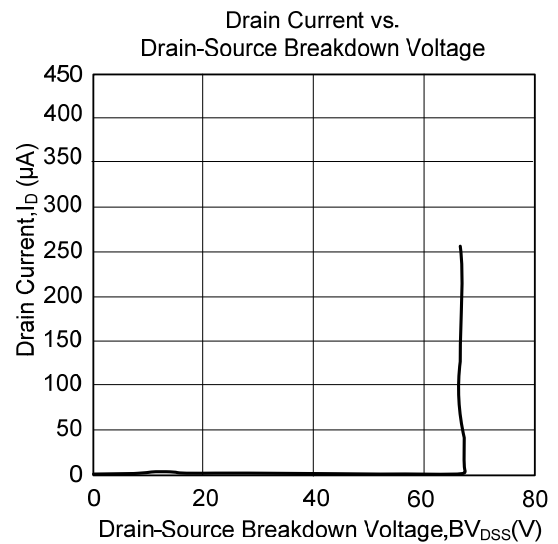
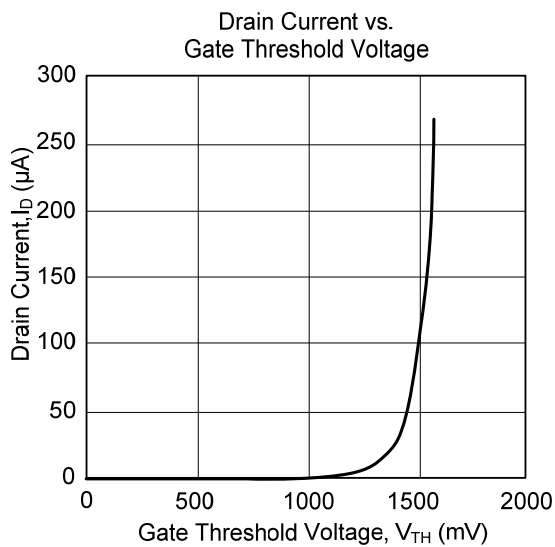
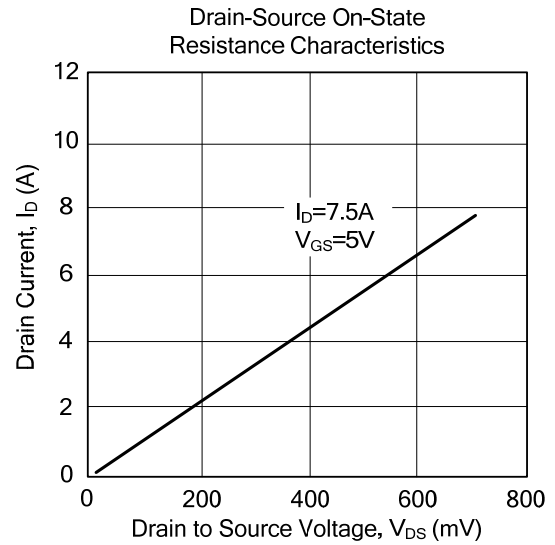
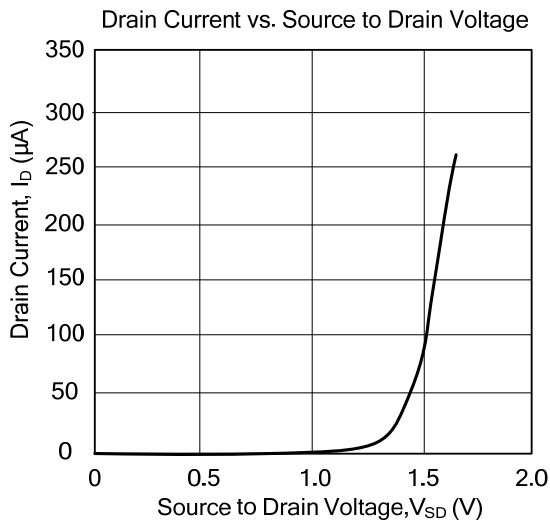


Fig. 4B Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



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