



UT5N10

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

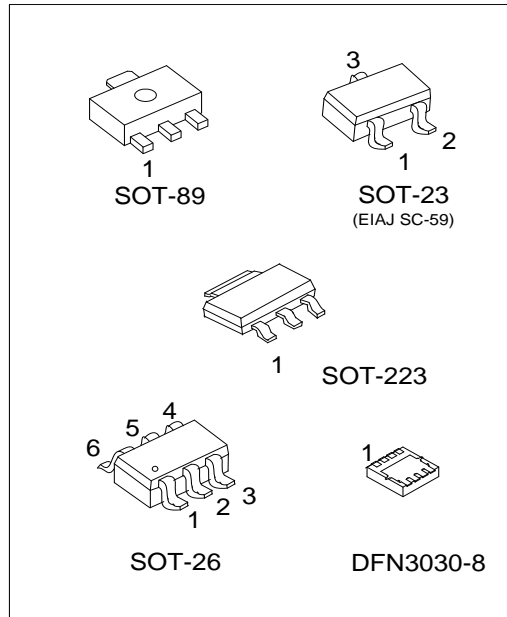
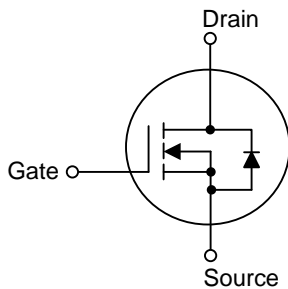
DESCRIPTION

The UTC **UT5N10** is an N-channel power MOSFET providing very low on-resistance. It has high efficiency and perfect cost-effectiveness. It can be generally applied in the commercial and industrial fields.

FEATURES

- * $R_{DS(ON)} \leq 0.165\Omega$ @ $V_{GS}=10V, I_D=3.0A$
- $R_{DS(ON)} \leq 0.180\Omega$ @ $V_{GS}=4.5V, I_D=2.0A$
- * Simple drive requirement

SYMBOL



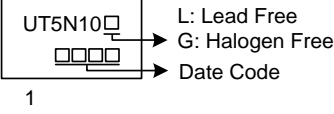
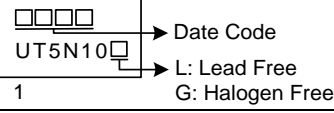
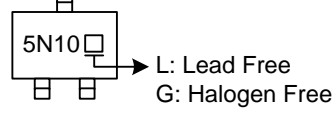
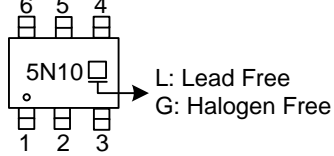
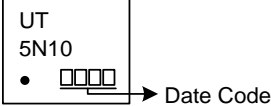
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT5N10L-AA3-R	UT5N10G-AA3-R	SOT-223	G	D	S	-	-	-	-	-	Tape Reel
UT5N10L-AB3-R	UT5N10G-AB3-R	SOT-89	G	D	S	-	-	-	-	-	Tape Reel
UT5N10L-AE3-R	UT5N10G-AE3-R	SOT-23	G	S	D	-	-	-	-	-	Tape Reel
UT5N10L-AG6-R	UT5N10G-AG6-R	SOT-26	D	D	G	S	D	D	-	-	Tape Reel
UT5N10L-K08-3030-R	UT5N10G-K08-3030-R	DFN3030-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT5N10G-AA3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AA3: SOT-223, AB3: SOT-89, AE3: SOT-23 AG6: SOT-26, K08-3030: DFN3030-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING

PACKAGE	MARKING
SOT-223	 <p>L: Lead Free G: Halogen Free Date Code</p>
SOT-89	 <p>Date Code L: Lead Free G: Halogen Free</p>
SOT-23	 <p>L: Lead Free G: Halogen Free</p>
SOT-26	 <p>L: Lead Free G: Halogen Free</p>
DFN3030-8	 <p>Date Code</p>

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ($V_{GS}=4.5\text{V}$, $T_A=25^\circ\text{C}$) (Note 2)	I_D	5	A
Pulsed Drain Current (Note 3, 4)	I_{DM}	10	A
Power Dissipation ($T_A=25^\circ\text{C}$)	SOT-223	0.89	W
	SOT-89	0.55	W
	SOT-23 SOT-26	0.35	W
	DFN3030-8	0.96	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature	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. Surface mounted on 1 in² copper pad of FR4 board; 270 $^\circ\text{C}/\text{W}$ when mounted on min. copper pad.

3. Repetitive Rating: Pulse width limited by maximum junction temperature.

4. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient (Note)	SOT-223	140	$^\circ\text{C}/\text{W}$
	SOT-89	180	$^\circ\text{C}/\text{W}$
	SOT-23 SOT-26	350	$^\circ\text{C}/\text{W}$
	DFN3030-8	130	$^\circ\text{C}/\text{W}$

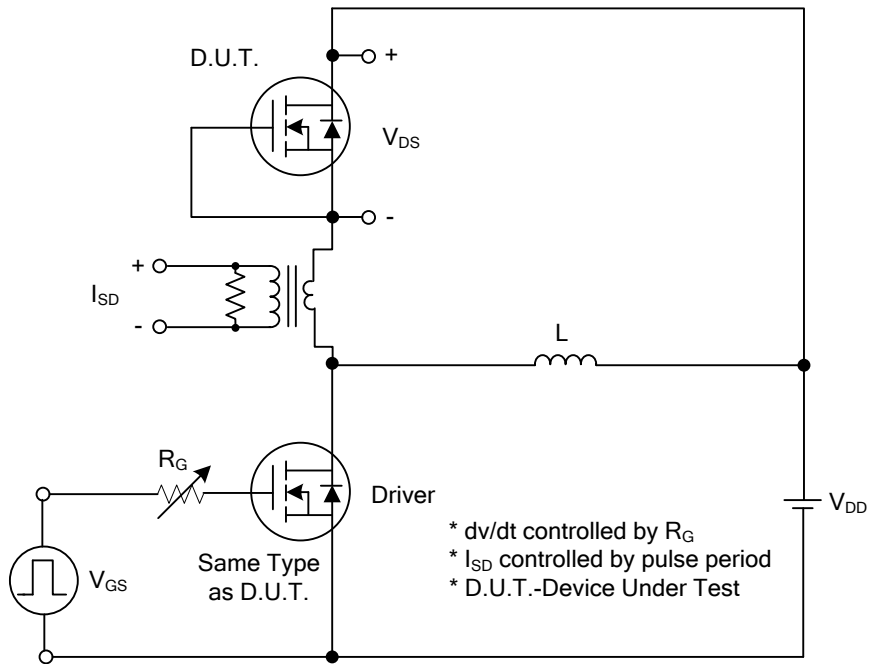
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

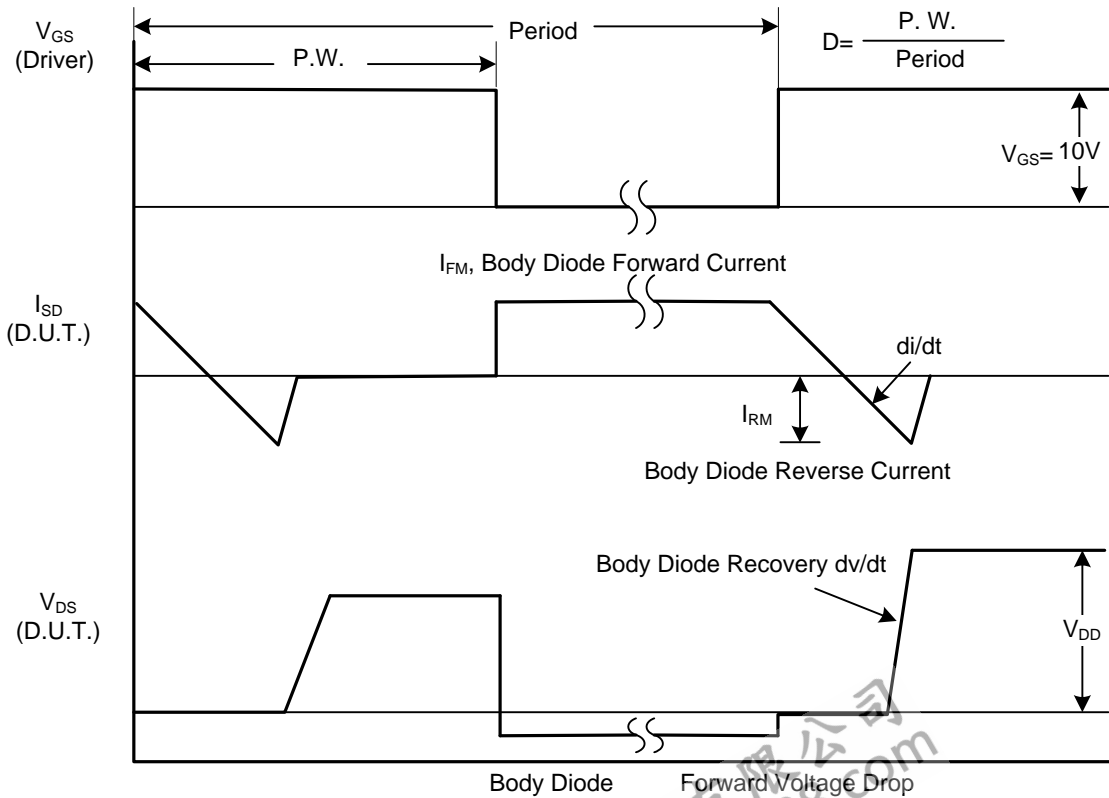
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	V _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta V_{DSS}}{\Delta T_J}$	Reference to 25°C, I _D =1mA		0.05		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0		3.0	V
Drain to Source On-state Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3.0A			0.165	Ω
		V _{GS} =4.5V, I _D =2.0A			0.180	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		490	780	pF
Output Capacitance	C _{OSS}			41		pF
Reverse Transfer Capacitance	C _{RSS}			33		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q _G	V _{GS} =4.5V, V _{DS} =48V, I _D =3A		18		nC
Gate Source Charge	Q _{GS}			3.76		nC
Gate Drain Charge	Q _{GD}			8.5		nC
Turn-ON Delay Time (Note)	t _{D(ON)}	V _{GS} =10V, V _{DS} =30V, I _D =1A, R _D =30Ω, R _G =3.3Ω		22		ns
Turn-ON Rise Time	t _R			18		ns
Turn-OFF Delay Time	t _{D(OFF)}			190		ns
Turn-OFF Fall-Time	t _F			65		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note)	V _{SD}	I _S =1.2A, V _{GS} =0V			1.2	V
Reverse Recovery Time	t _{rr}	I _S =3A, V _{GS} =0V, di/dt=100A/μs		25		ns
Reverse Recovery Charge	Q _{rr}				26	

Note: Pulse width ≤300μs, duty cycle ≤2%.

TEST CIRCUITS AND WAVEFORMS

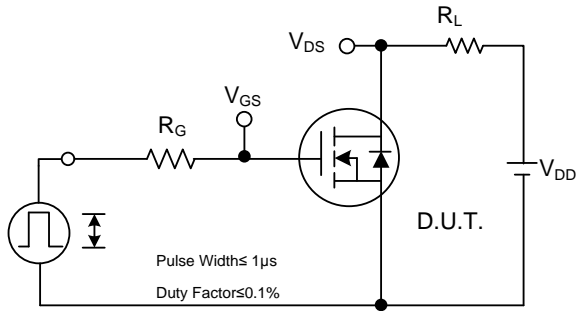


Peak Diode Recovery dv/dt Test Circuit

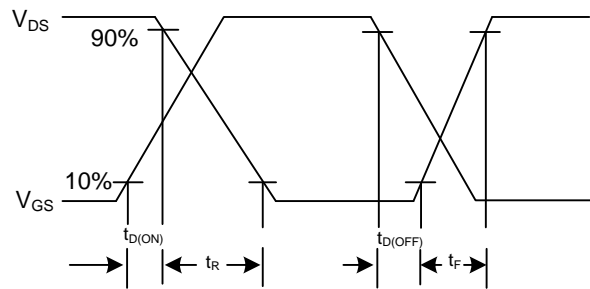


Peak Diode Recovery dv/dt Waveforms

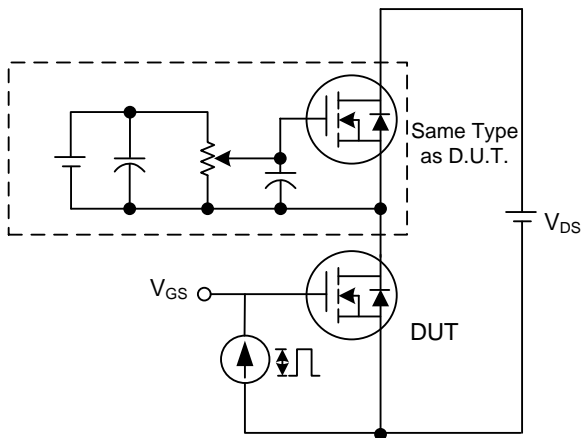
TEST CIRCUITS AND WAVEFORMS



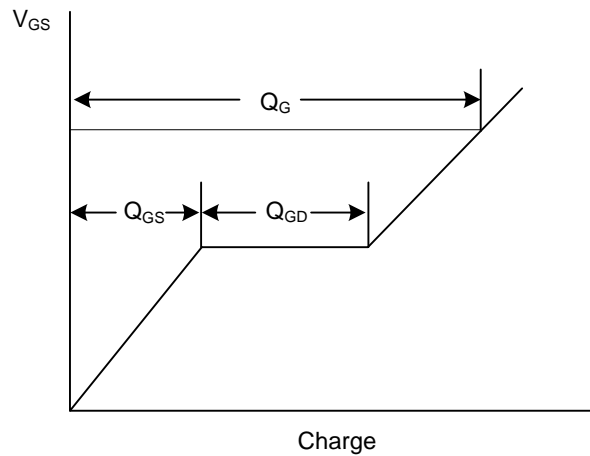
Switching Test Circuit



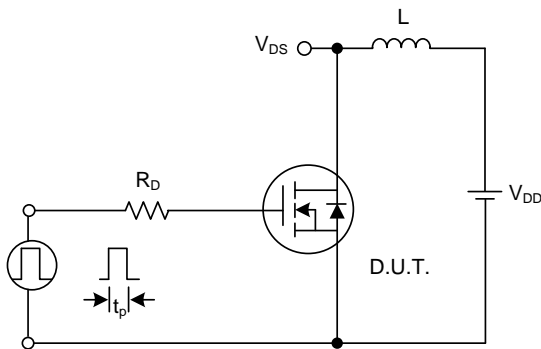
Switching Waveforms



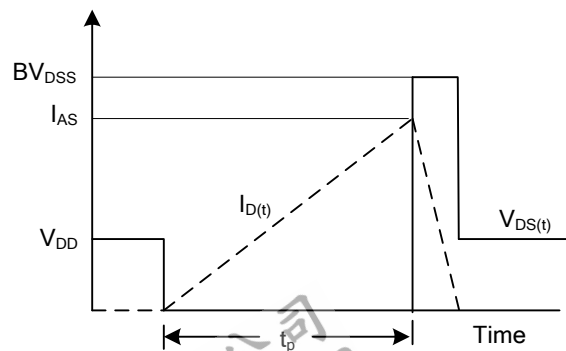
Gate Charge Test Circuit



Gate Charge Waveform

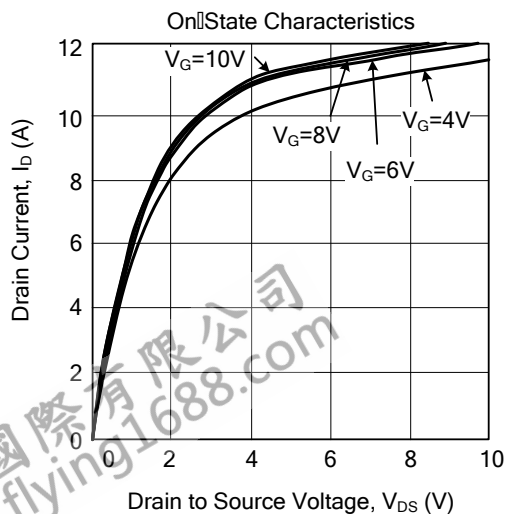
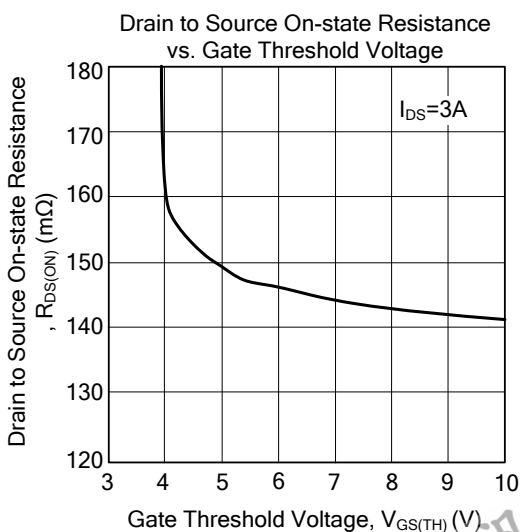
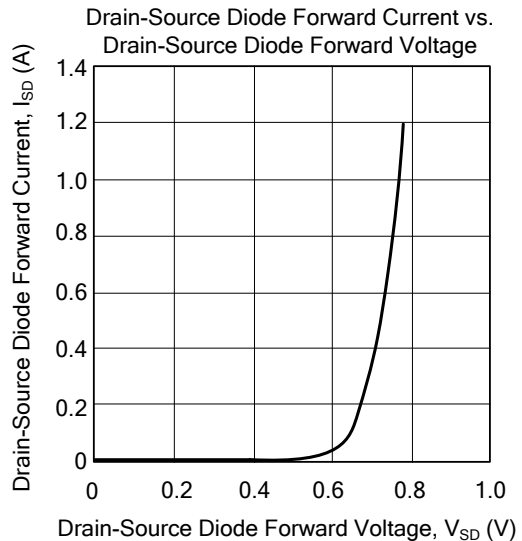
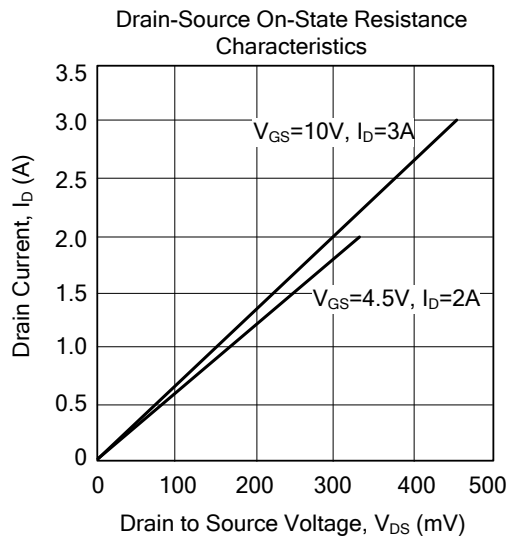
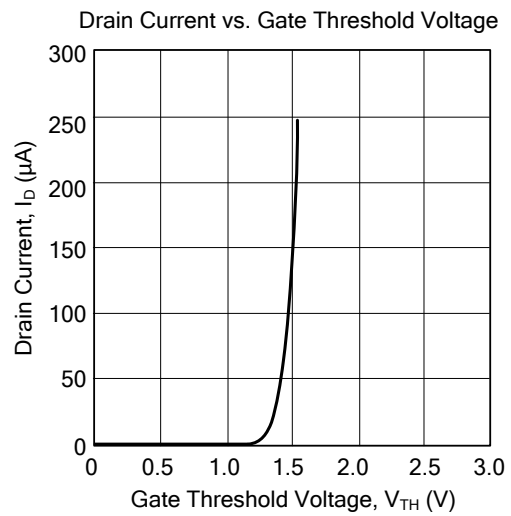
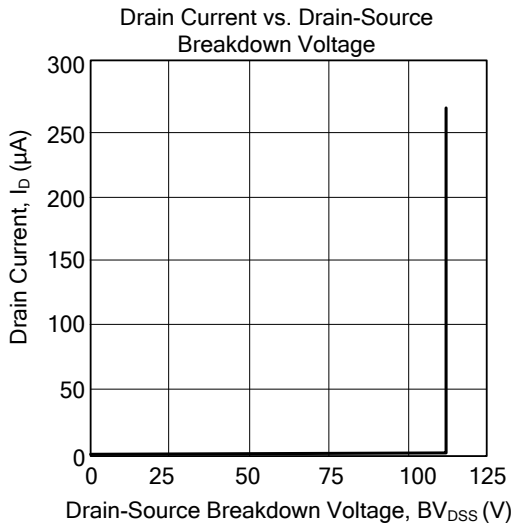


Unclamped Inductive Switching Test Circuit

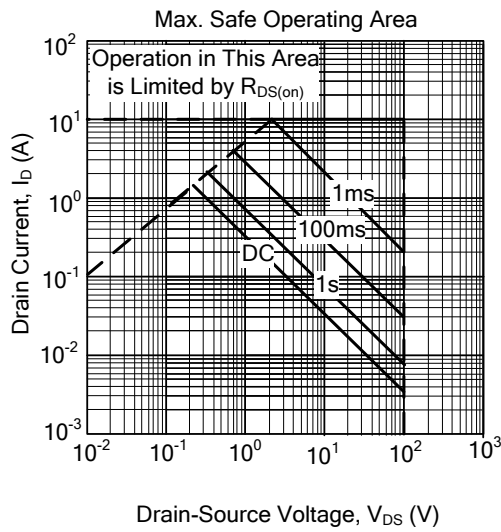


Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



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