



## UT3418

Power MOSFET

### N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

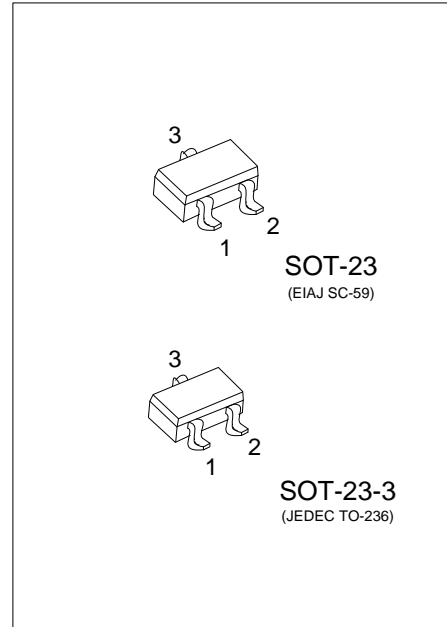
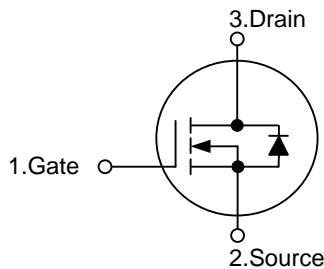
#### DESCRIPTION

The **UT3418** 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

- \*  $R_{DS(ON)} \leq 60m\Omega @ V_{GS} = 10 V$
- $R_{DS(ON)} \leq 70m\Omega @ V_{GS} = 4.5 V$
- $R_{DS(ON)} \leq 155m\Omega @ V_{GS} = 2.5 V$
- \* Low capacitance
- \* Low gate charge
- \* Fast switching capability
- \* Avalanche energy specified

#### SYMBOL



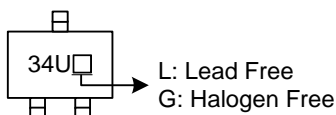
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT3418L-AE2-R	UT3418G-AE2-R	SOT-23-3	G	S	D	Tape Reel
UT3418L-AE3-R	UT3418G-AE3-R	SOT-23	G	S	D	Tape Reel

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

<p>UT3418G-AE2-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



## ■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNITS
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Continuous Drain Current	I <sub>D</sub>	3.8	A
Pulsed Drain Current (Note 2)	I <sub>DM</sub>	15	A
Power Dissipation	P <sub>D</sub>	1.4	W
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°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. Repetitive Rating: Pulse width limited by maximum junction temperature.

## ■ THERMAL CHARACTERISTICS (Note)

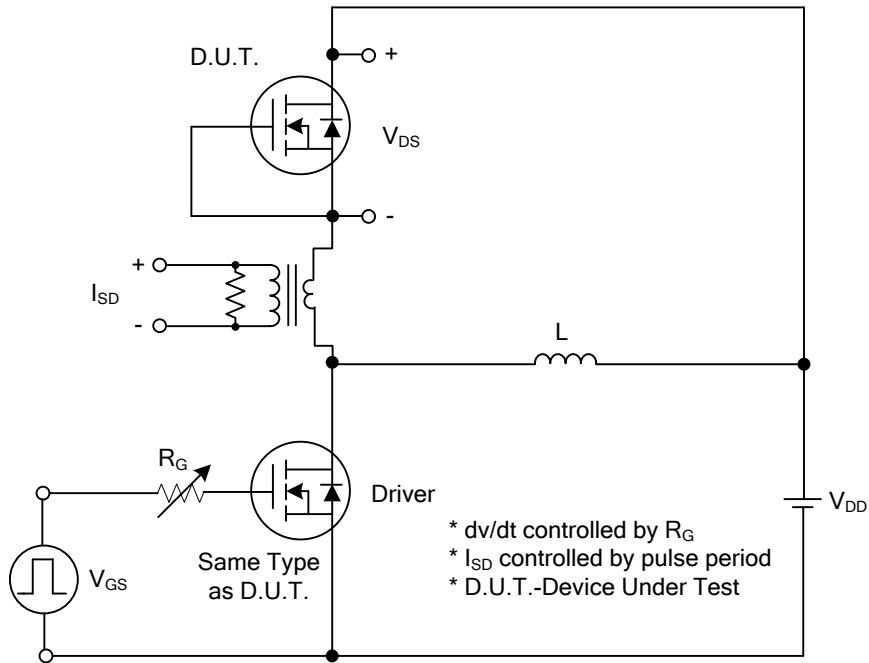
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	125	°C/W

Note: Device mounted on FR-4 substrate P<sub>C</sub> board, 2oz copper, with 1inch square copper plate.

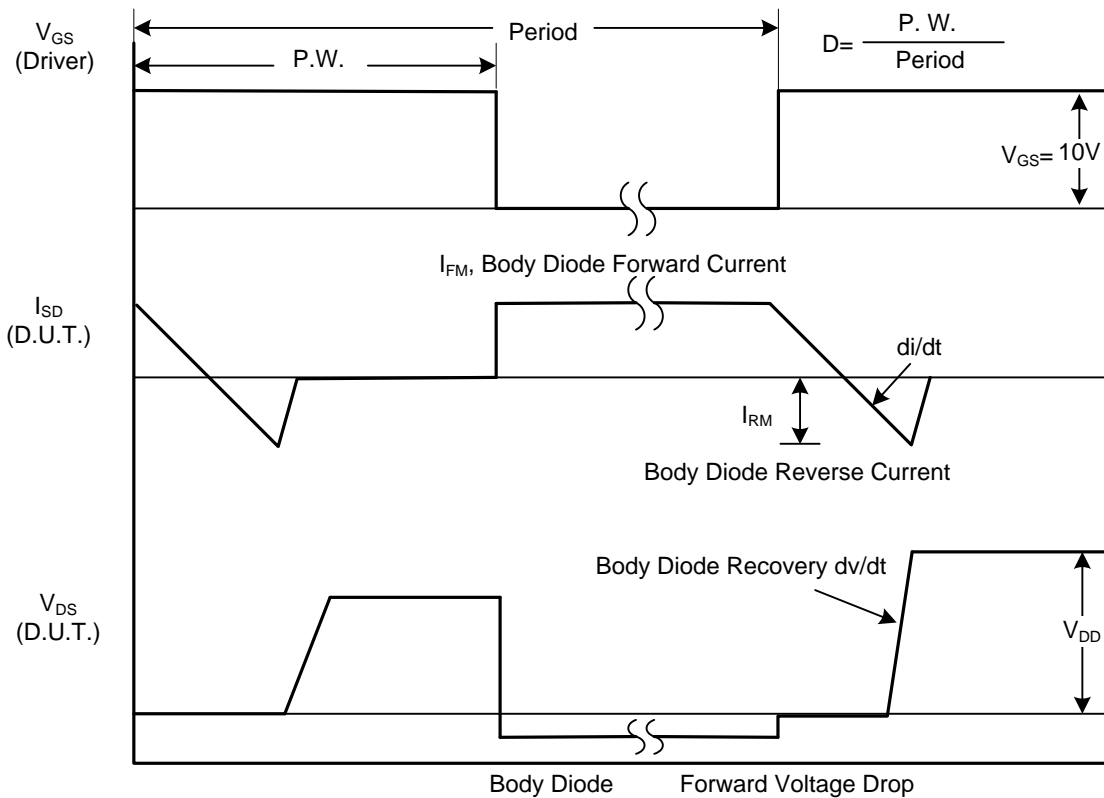
## ■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	30			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V		0.001	1	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			100	nA
<b>ON CHARACTERISTICS</b>						
Gate-Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5		1.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.8A		43	60	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.5A		52	70	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =1A		101	155	mΩ
On-State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =4.5V	15			A
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1.0MHz		226	270	pF
Output Capacitance	C <sub>OSS</sub>			39		pF
Reverse Transfer Capacitance	C <sub>RSS</sub>			29		pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.8A		3	3.6	nC
Gate Source Charge	Q <sub>GS</sub>			1.4		nC
Gate Drain Charge	Q <sub>GD</sub>			0.55		nC
Turn-ON Delay Time	t <sub>D(ON)</sub>	V <sub>DS</sub> =15V, R <sub>L</sub> =3.9Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		2.6	4	ns
Turn-ON Rise Time	t <sub>R</sub>			3.2	5	ns
Turn-OFF Delay Time	t <sub>D(OFF)</sub>			14.5	22	ns
Turn-OFF Fall-Time	t <sub>F</sub>			2.1	3	ns
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Maximum Body-Diode Continuous Current	I <sub>S</sub>				2.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V		0.81	1	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =3.8A, dI/dt=100A/μs		10.2	13	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			3.8	5	nC

■ TEST CIRCUITS AND WAVEFORMS

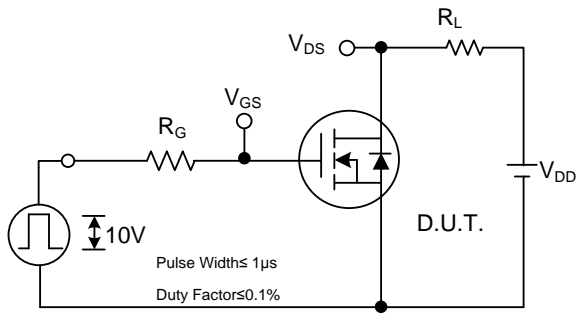


Peak Diode Recovery  $dv/dt$  Test Circuit

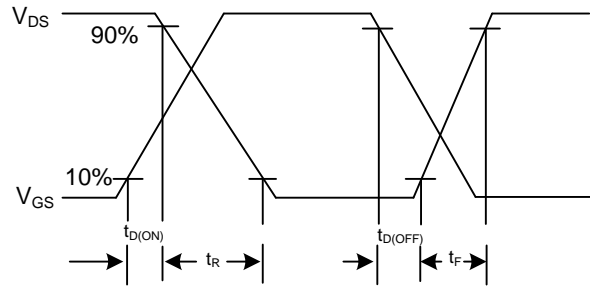


Peak Diode Recovery  $dv/dt$  Waveforms

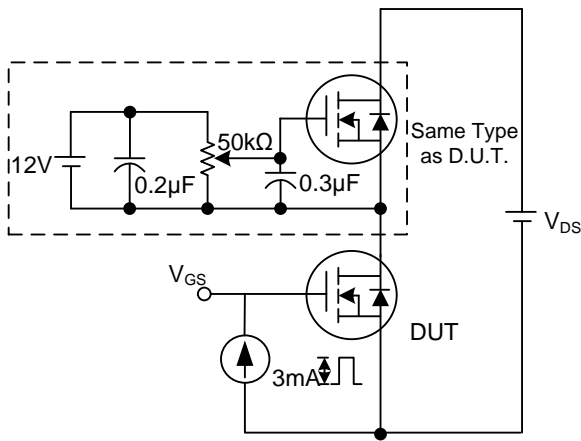
■ TEST CIRCUITS AND WAVEFORMS



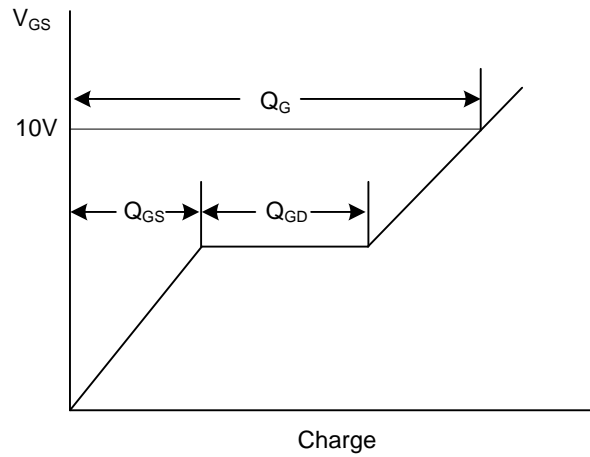
Switching Test Circuit



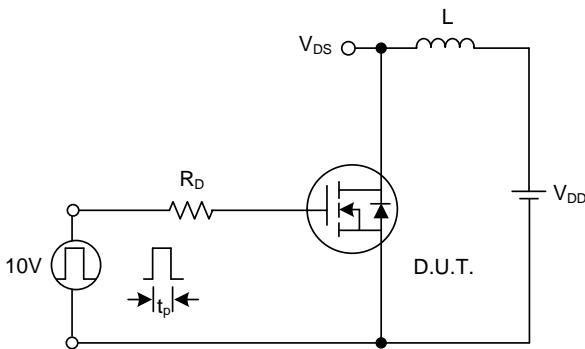
Switching Waveforms



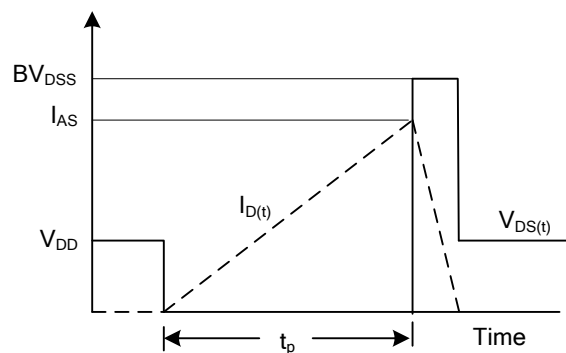
Gate Charge Test Circuit



Gate Charge Waveform

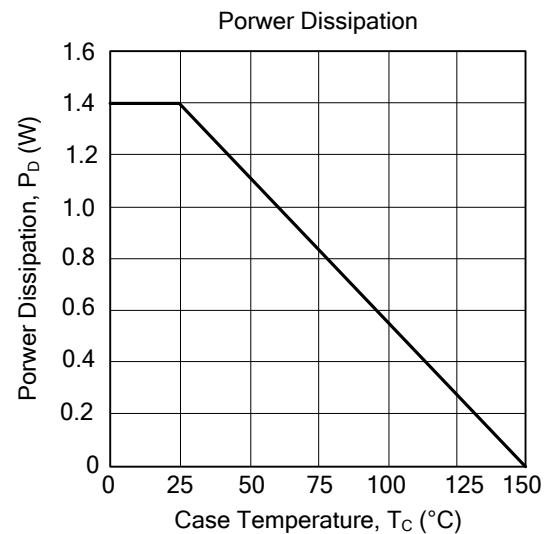
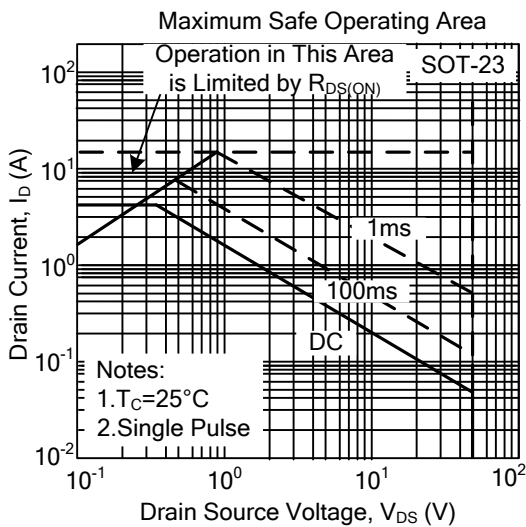
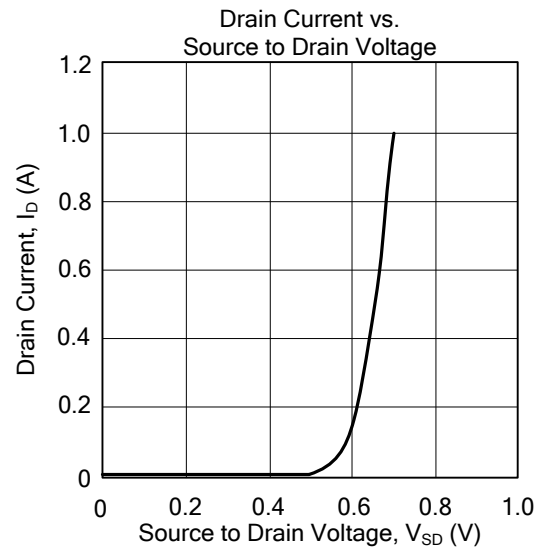
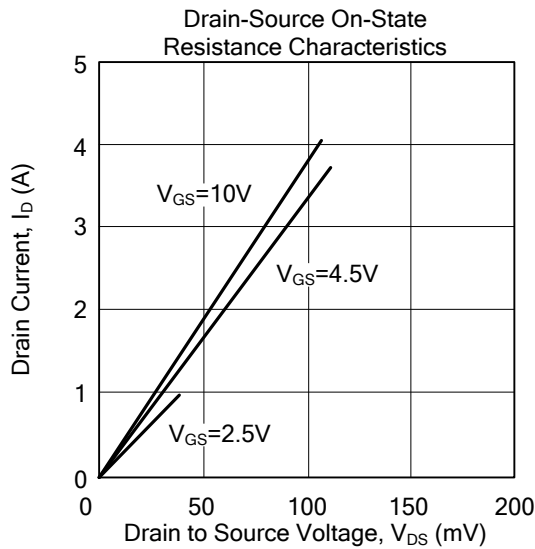
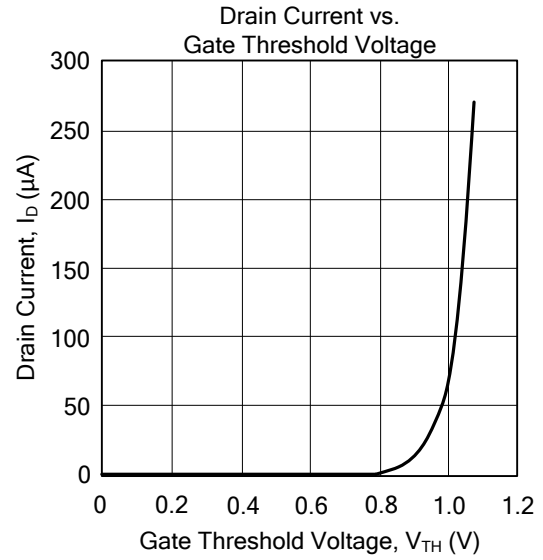
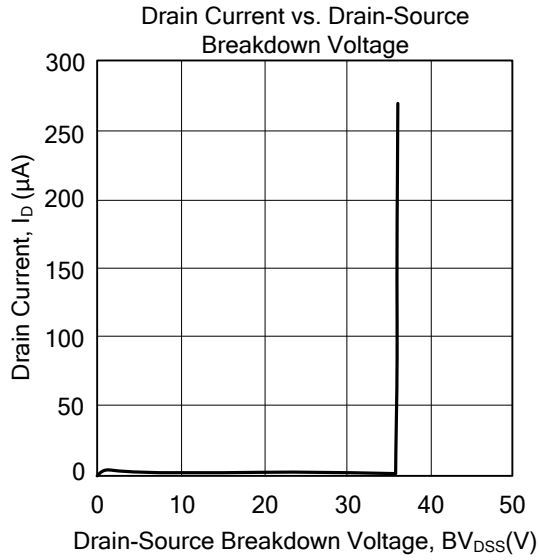


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

## ■ TYPICAL CHARACTERISTICS



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