



UT8067

Preliminary

Power MOSFET

9A, 30V, N-CHANNEL MOSFET

DESCRIPTION

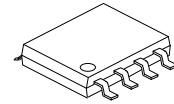
The UTC **UT8067** is an N-channel MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance, etc.

The UTC **UT8067** is suitable for high-efficiency DC-DC converters, mobile handsets and notebook PCs.

FEATURES

* $R_{DS(ON)} < 33\text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=4.5\text{A}$

* High switching speed



SOP-8

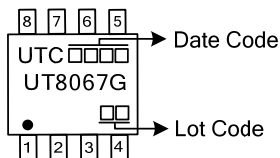
ORDERING INFORMATION

Ordering Number	Package	Pin Assignment								Packing
		1	2	3	4	5	6	7	8	
UT8067G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT8067G-S08-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free
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MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous (Note 1)	I_D	9	A
	Pulsed (Note 1)	I_{DM}	36	A
Avalanche Current		I_{AR}	9	A
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	21	mJ
Power Dissipation ($t=10\text{s}$)		P_D	1.0	W
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature Range		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. Repetitive Rating: Pulse width limited by maximum junction temperature

3. $L = 0.2\text{mH}$, $I_{AS} = 9\text{A}$, $V_{DD} = 24\text{V}$, $R_G = 1.2\Omega$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient ($t=10\text{s}$)	θ_{JA}	125	$^\circ\text{C/W}$

Note: Surface Mounted on 25.4 mm×25.4 mm×0.8mm FR4 Board.

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =10mA, V _{GS} =0V	30			V
		BV _{DSX}	I _D =10mA, V _{GS} =-20V	15			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =30V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+20V, V _{DS} =0V			+0.1	μA
	Reverse		V _{GS} =-20V, V _{DS} =0V			-0.1	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =10V, I _D =0.1mA	1.3		2.3	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =4.5V, I _D =4.5A		26	33	mΩ
			V _{GS} =10V, I _D =4.5A		20	25	
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =10V, f=1.0MHz		690		pF
Output Capacitance		C _{OSS}			120		pF
Reverse Transfer Capacitance		C _{RSS}			28		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DD} ≈24V, V _{GS} =10V, I _D =9A		9.5		nC
			V _{DD} ≈24V, V _{GS} =5V, I _D =9A		4.7		nC
Gate to Source Charge		Q _{GS}	V _{DD} ≈24V, V _{GS} =10V, I _D =9A		2.2		nC
Gate to Drain Charge		Q _{GD}			0.9		nC
Gate Resistance		R _G	V _{GS} =0V, V _{DS} =10V, f=5MHz		3.4	5.1	Ω
Turn-ON Delay Time		t _{D(ON)}			6.7		ns
Rise Time		t _R			2.1		ns
Turn-OFF Delay Time		t _{D(OFF)}			15		ns
Fall-Time		t _F			2.1		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V _{SD}	I _{SD} =9A, V _{GS} =0V			-1.2	V
Continuous Drain-Source Current		I _{SD}				36	A

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

D.U.T.

V_{DS}

V_{GS}

R_G

Driver

Same Type as D.U.T.

L

V_{DD}

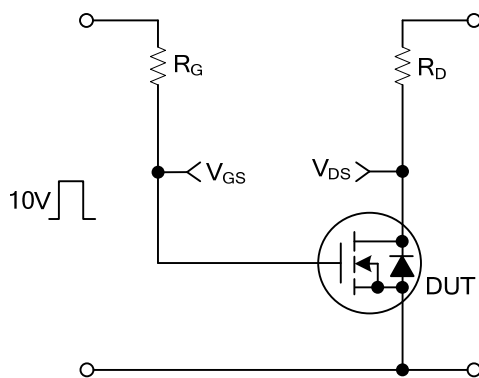
- * dv/dt controlled by R_G
- * I_{SD} controlled by pulse period
- * D.U.T.-Device Under Test

Timing diagram for a MOSFET switching a load inductor. The diagram shows three waveforms: V_{GS} (Driver), I_{SD} (D.U.T.), and V_{DS} (D.U.T.).

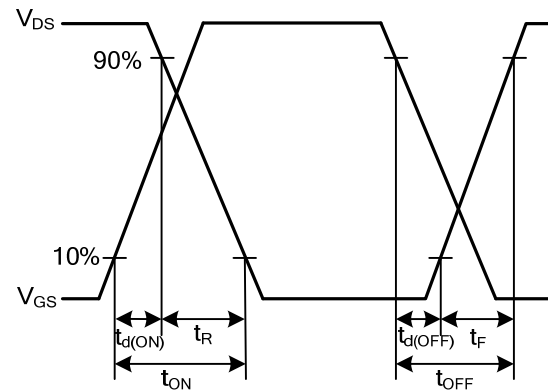
- V_{GS} (Driver): A square wave with pulse width (P.W.) and period (Period). The duty cycle is $D = \frac{P.W.}{Period}$. The gate voltage is $V_{GS} = 10V$.
- I_{SD} (D.U.T.): The drain current. It shows forward current I_{FM} (Body Diode Forward Current) during the pulse and reverse current I_{RM} (Body Diode Reverse Current) during the recovery phase. The slope of the reverse current is di/dt .
- V_{DS} (D.U.T.): The drain-source voltage. It shows the voltage drop during the pulse and the recovery dv/dt during the off-time. The body diode forward voltage drop is also indicated.

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QW-R210-005.b

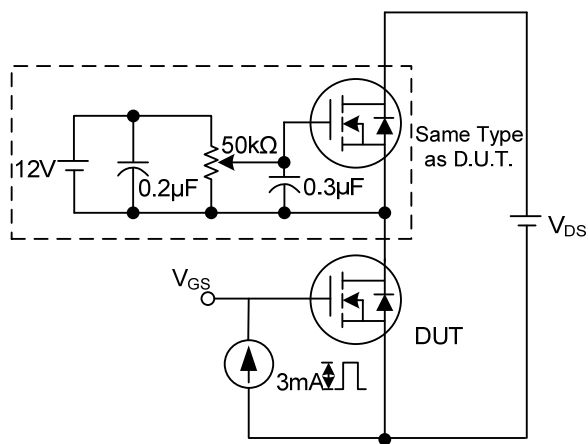
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



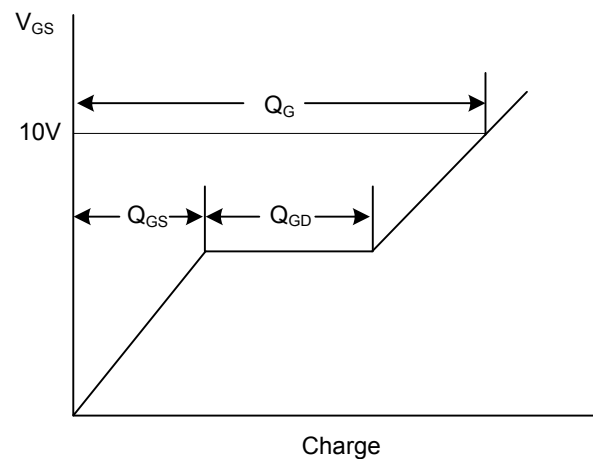
Switching Test Circuit



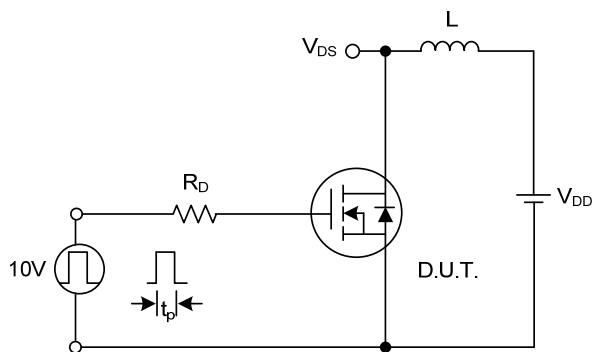
Switching Waveforms



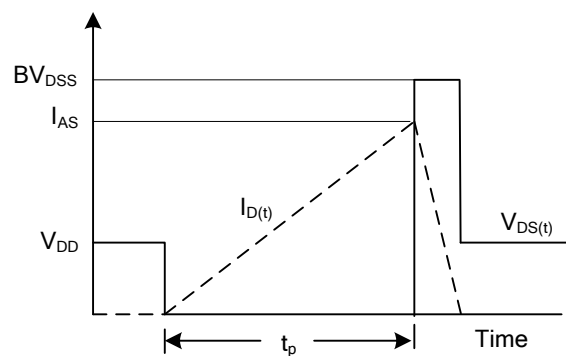
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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