



UTM3052-H

Preliminary

POWER MOSFET

62A, 30V N-CHANNEL FAST SWITCHING MOSFET

DESCRIPTION

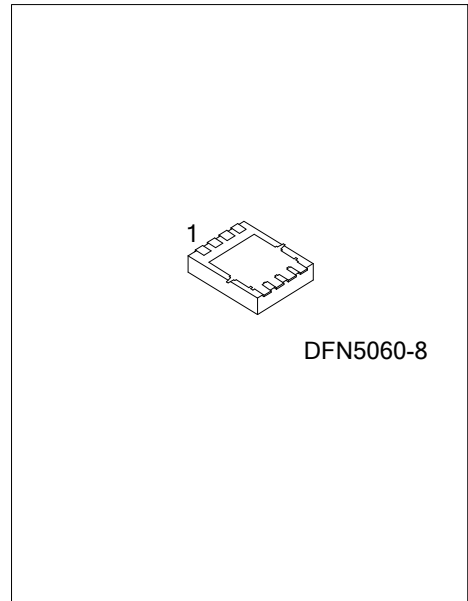
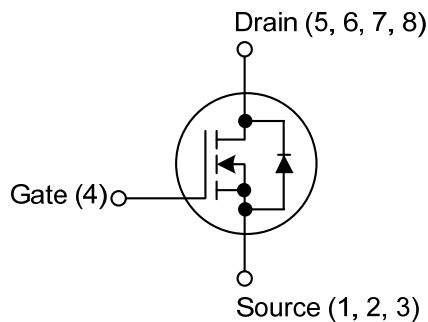
The UTC **UTM3052-H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance and low gate charge.

The UTC **UTM3052-H** is suitable for load switch and networking DC-DC power system, etc.

FEATURES

- * $R_{DS(ON)} < 8.0m\Omega @ V_{GS}=10V, I_D=30A$
- * Super low gate charge

SYMBOL



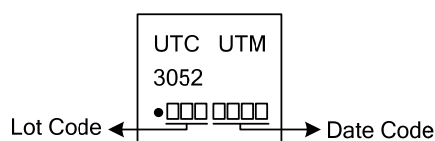
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing		
Lead Free	Halogen Free		1	2	3	4	5	6		7	8
UTM3052L-K08-5060-R	UTM3052G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) K08-5060: DFN5060-8
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V_{DSS}	30	V	
Gate-Source Voltage		V_{GSS}	±20	V	
Drain Current	Continuous	I_D	$V_{GS}=10V, T_C=25^{\circ}C$ (Note 2, 6)	62	A
			$V_{GS}=10V, T_C=100^{\circ}C$ (Note 2)	40	A
			$V_{GS}=10V, T_A=25^{\circ}C$ (Note 2)	13.1	A
			$V_{GS}=10V, T_A=70^{\circ}C$ (Note 2)	10.5	A
	Pulsed (Note 3)		I_{DM}	150	A
Avalanche Energy Single Pulse (Note 4)		E_{AS}	69	mJ	
Avalanche Current		I_{AS}	37	A	
Total Power Dissipation (Note 5)	$T_C=25^{\circ}C$	P_D	46.3	W	
	$T_A=25^{\circ}C$		2	W	
Operating Junction Temperature Range		T_J	-55 ~ +150	$^{\circ}C$	
Storage Temperature Range		T_{STG}	-55 ~ +150	$^{\circ}C$	

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.

- The data tested by surface mounted on a 1 inch² FR-4 board with 2 OZ copper
- The data tested by pulsed, pulse width ≤ 300 μs; duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=37A$
- The power dissipation is limited by 150 $^{\circ}C$ junction temperature
- Package limitation current is 85A

■ THERMAL RESISTANCE (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	$^{\circ}C/W$
Junction to Case	θ_{JC}	2.7	$^{\circ}C/W$

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1\text{mA}$		0.01		$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$, $T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$			5	μA
Gate-Source Leakage Current	Forward	$V_{GS}=20\text{V}$, $V_{DS}=0\text{V}$			100	nA
	Reverse	$V_{GS}=-20\text{V}$, $V_{DS}=0\text{V}$			-100	nA
ON CHARACTERISTICS						
Static Drain-Source On-State Resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=30\text{A}$		6.4	8.0	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=15\text{A}$		10	12.5	m Ω
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.2	1.5	2.5	V
$V_{GS(TH)}$ Temperature Coefficient	$\Delta V_{GS(TH)}$			-3.1		$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{FS}	$V_{DS}=5\text{V}$, $I_D=30\text{A}$		41		S
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1.0\text{MHz}$		600		pF
Output Capacitance	C_{OSS}			120		pF
Reverse Transfer Capacitance	C_{RSS}			70		Pf
Gate Resistance	R_G	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1.0\text{MHz}$		3.9	5.8	Ω
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=30\text{V}$, $I_D=0.5\text{A}$, $R_G=25\Omega$ $V_{GS}=10\text{V}$		20		ns
Rise Time	t_R			48		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			165		ns
Fall Time	t_F			170		ns
Total Gate Charge	Q_G	$I_D=1\text{A}$, $V_{DS}=30\text{V}$, $V_{GS}=10\text{V}$ $I_G=100\mu\text{A}$		60		nC
Gate to Source Charge	Q_{GS}			1.0		nC
Gate to Drain ("Miller") Charge	Q_{GD}			5.5		nC
GUARANTEED AVALANCHE CHARACTERISTICS						
Single Pulse Avalanche Energy (Note 3)	E_{AS}	$V_{DD}=25\text{V}$, $L=0.1\text{mH}$, $I_{AS}=30\text{A}$	45			mJ
DIODE CHARACTERISTICS						
Continuous Source Current (Note 1, 4)	I_S	$V_G=V_D=0\text{V}$, Force Current			62	A
Pulsed Source Current (Note 2, 4)	I_{SM}				150	A
Diode Forward Voltage (Note 2)	V_{SD}	$T_J=25^\circ\text{C}$, $I_S=1\text{A}$, $V_{GS}=0\text{V}$			1	V

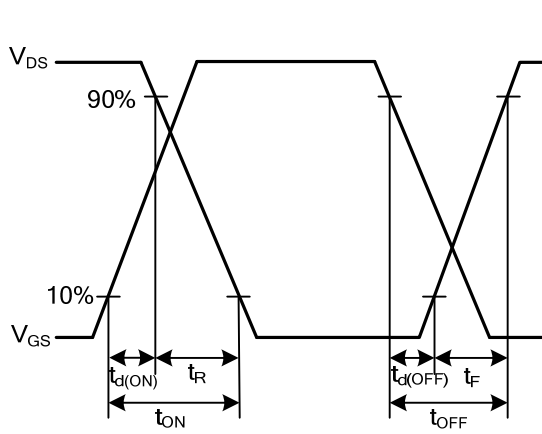
Notes: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2 OZ copper

2. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$

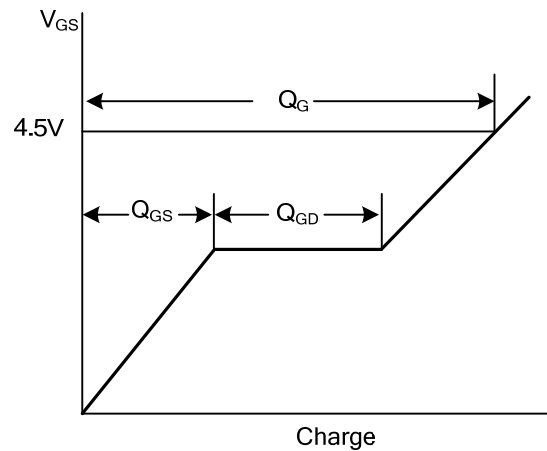
3. The Min. value is 100% EAS tested guarantee

4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation

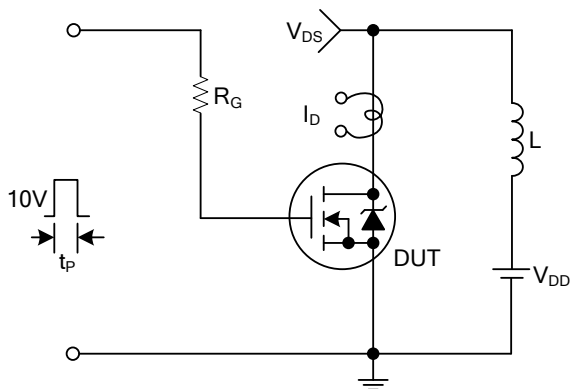
■ TEST CIRCUITS AND WAVEFORMS



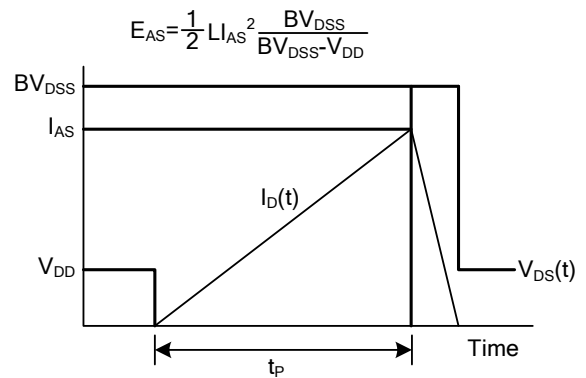
Resistive Switching Waveforms



Gate Charge Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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