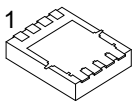
UTM3052-H

Preliminary | ***POWER MOSFET***

62A, 30V N-CHANNEL FAST SWITCHING MOSFET



PDFN5×6

■ DESCRIPTION

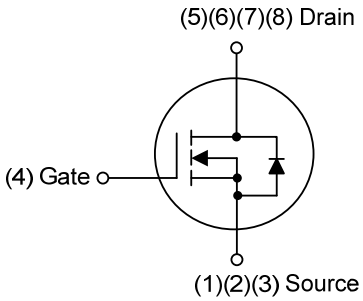
The UTC **UTM3052-H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with a minimum on-state resistance and low gate charge.

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

■ FEATURES

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

■ SYMBOL



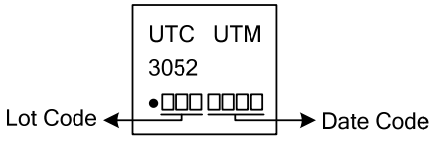
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTM3052L-P5060-R	UTM3052G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

UTM3052G-P5060-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) P5060: PDFN5×6 (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	V_{GS}=10V, T_C=25°C (Note 2, 6)	I_D	62	A
		V_{GS}=10V, T_C=100°C (Note 2)		40	A
		V_{GS}=10V, T_A=25°C (Note 2)		13.1	A
		V_{GS}=10V, T_A=70°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°C	P_D	46.3	W
		T_A=25°C		2	W
Operating Junction Temperature Range			T_J	-55 ~ +150	°C
Storage Temperature Range			T_{STG}	-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. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2 OZ copper
3. The data tested by pulsed, pulse width ≤ 300 μs; duty cycle ≤ 2%
4. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=37A
5. The power dissipation is limited by 150°C junction temperature
6. Package limitation current is 85A

■ THERMAL RESISTANCE (Note 2)

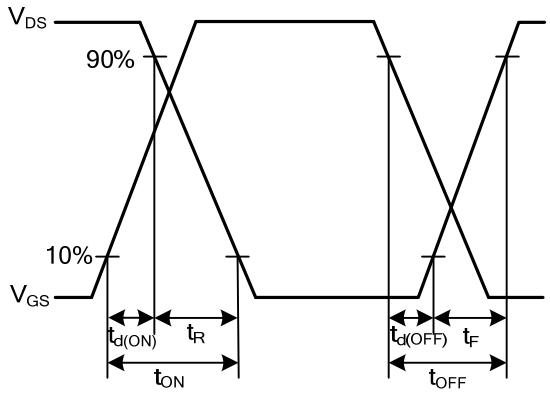
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62	°C/W
Junction to Case	θ_{JC}	2.7	°C/W

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

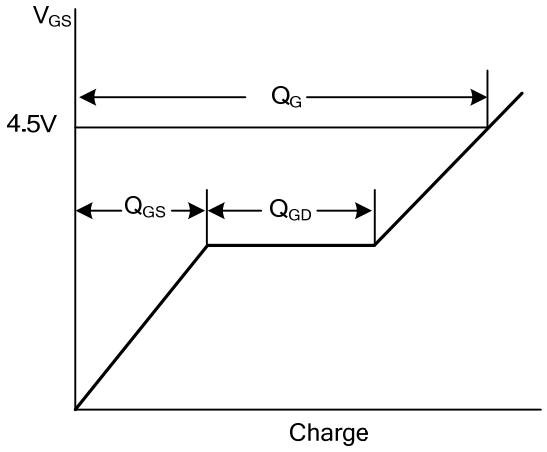
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	30			V
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA		0.01		V/°C
Drain-Source Leakage Current		I_{DSS}	V_{DS}=24V,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

Notes: 1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2 OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs; duty cycle ≤ 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

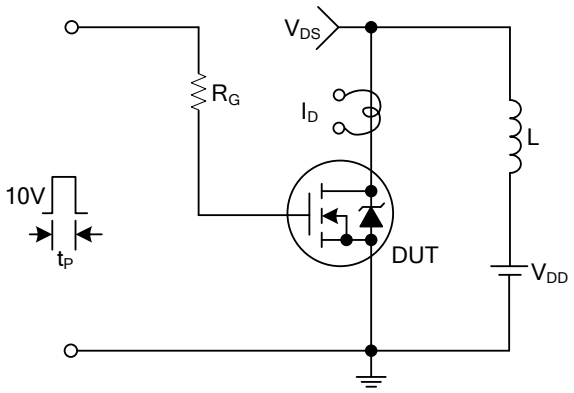
■ TEST CIRCUITS AND WAVEFORMS



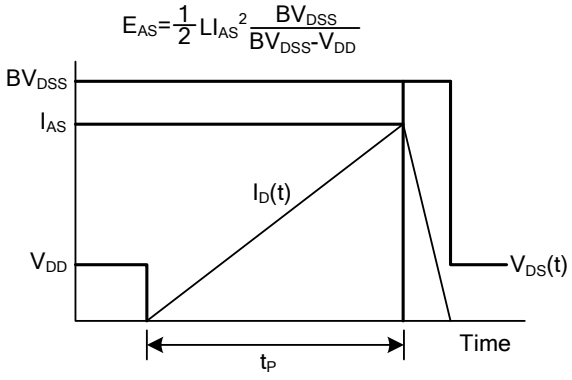
Resistive Switching Waveforms



Gate Charge Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms