

UTM6016

Power MOSFET

8A, 60V N-CHANNEL FAST SWITCHING MOSFET

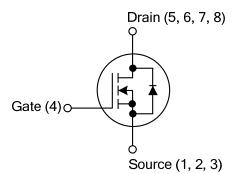
DESCRIPTION

The UTC **UTM6016** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UTM6016** is suitable for application in networking DC-DC power system and LCD/LED back light, etc.

FEATURES

- * $R_{DS(ON)}$ < 12 m Ω @ V_{GS} = 10V, I_{D} =8A
- $R_{DS(ON)}$ < 15 m Ω @ V_{GS} = 4.5V, I_D=6A
- * Low gate charge
- * Excellent CdV/dt effect decline
- * High switching speed
- SYMBOL



SOP-8

ORDERING INFORMATION

Ordering Number	Package	Pin Assignment						Decking		
Ordering Number		1	2	3	4	5	6	7	8	Packing
UTM6016G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTM6016G-K08-5060-R	DFN-8(5×6)	S	S	S	G	D	D	D	D	Tape Reel
Noto: Din Assignment: C: Cate D: Drain	C: Couroo									

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

UTM6016G- <u>S08-R</u> UTM6016G-S08-R (1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) S08: SOP-8, K08-5060: DFN-8(5×6)
(3)Green Package	(3) G: Halogen Free and Lead Free

MARKING

SOP-8	DFN-8(5×6)				
8 7 6 5 UTC □□□□ > Date Code UTM6016G □□ > Lot Code 1 2 3 4	UTC UTM 6016 Lot Code				

ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT	
Drain-Source Voltage		V _{DSS}	60	V	
Gate-Source Voltage		V _{GSS}	±20	V	
	Continuous	T _A =25°C		8	А
Drain Current V _{GS} @ 10V (Note 1)	T _A =70°C	ID	6.4	А	
Pulsed (Note 2)			I _{DM}	32	А
Avalanche Current		I _{AS}	38	А	
Single Pulse Avalanche Energy (Note 3)		E _{AS}	123	mJ	
Power Dissipation (T _A =25°C) (Note 4) $\frac{\text{SOP-8}}{\text{DFN-8}(5\times6)}$		Р	1.5	W	
		PD	1.92	W	
Junction Temperature		TJ	-55~+150	°C	
Storage Temperature Range		T _{STG}	-55~+150	°C	

Note: 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.

■ THERMAL CHARACTERISTICS (Note 1)

PARAMETER		SYMBOL	RATINGS	UNIT	
lunction to Ambient	SOP-8	ο	85	°C/W	
Junction to Ambient	DFN-8(5×6)	θ_{JA}	65	C/W	
lunction to Coop	SOP-8	0	24	°C/W	
Junction to Case	DFN-8(5×6)	θ _{JC}	12	C/W	

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

2. The data tested by pulsed, pulse width \leq 300µs, duty cycle \leq 2%.

3. The EAS data shows Max. rating. The test condition is V_{DD} =25V, V_{GS} =10V, L=3.85mH, I_{AS}=8A.

4. The power dissipation is limited by 150°C junction temperature.



■ ELECTRICAL CHARACTERISTICS (TJ=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	60			V
BV _{DSS} Temperature Coefficient	$\triangle BV_{DSS} / \triangle T$	Reference to 25°C , I _D =1mA		0.052		V/°C
Drain Source Leekage Current		V _{DS} =48V, V _{GS} =0V, T _J =25°C			1	μA
Drain-Source Leakage Current	I _{DSS}	V _{DS} =48V, V _{GS} =0V, T _J =55°C			5	μA
Cata Source Lookage Current	rd	V _{GS} =+20V, V _{DS} =0V			+100	nA
Gate-Source Leakage Current Rever	se I _{GSS}	V _{GS} =-20V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}		1.2		2.5	V
V _{GS(TH)} Temperature Coefficient	$ riangle V_{GS(TH)}$	-V _{DS} =V _{GS} , I _D =250μA		-5.76		mV/°C
Static Drain-Source On-State Resistand	e	V _{GS} =10V, I _D =8A		10	12	mΩ
(Note 2)	R _{DS(ON)}	V _{GS} =4.5V, I _D =6A		12	15	mΩ
Forward Transconductance	g fs	V_{DS} =5V, I_{D} =8A		45		S
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}			1070	1200	pF
Output Capacitance	C _{OSS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		200	220	рF
Reverse Transfer Capacitance	C _{RSS}			190	210	pF
SWITCHING PARAMETERS (Note 2)						
Total Gate Charge (4.5V)	Q_{G}			290	310	nC
Gate to Source Charge	Q _{GS}	V_{GS} =10V, V_{DS} =48V, I_{D} =1A		10.7	15	nC
Gate to Drain Charge	Q_{GD}			30	45	nC
Turn-ON Delay Time	t _{D(ON)}			55	70	ns
Rise Time	t _R	V _{GS} =10V, V _{DD} =30V,		100	120	ns
Turn-OFF Delay Time	t _{D(OFF)}	R _G =3.3Ω, I _D =2A		580	620	ns
Fall-Time	t _F			190	210	ns
GUARANTEED AVALANCHE CHARA	CTERISTICS			-		
Single Pulse Avalanche Energy (Note 5) E _{AS}	V _{DD} =25V, L=0.1mH, I _{AS} =30A	77			mJ
DIODE CHARACTERISTICS		· · · · · · · · · · · · · · · · · · ·				
Continuous Source Current (Note 1, 6)	ls	V _G =V _D =0V , Force Current			8	Α
Pulsed Source Current (Note 2, 6)	I _{SM}				32	Α
Diode Forward Voltage (Note 2)	V _{SD}	V _{GS} =0V , I _S =8A , T _J =25°C			1.2	V
Reverse Recovery Time	trr			18		nS
Reverse Recovery Charge	Q _{rr}	I _F =8A, dl/dt=100A/µs, T _J =25°C		15.6		nC

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

2. The data tested by pulsed, pulse width≤300µs, duty cycle≤2%.

3. The EAS data shows Max. rating. The test condition is V_{DD} =25V, V_{GS} =10V, L=0.1mH, I_{AS}=30A.

4. The power dissipation is limited by 150°C junction temperature.

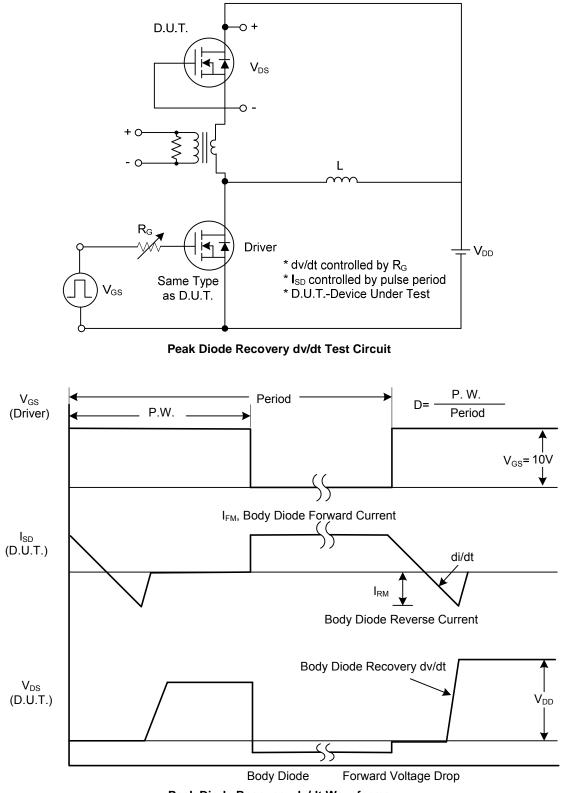
5. The Min. value is 100% EAS tested guarantee.

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



UTM6016

TEST CIRCUITS AND WAVEFORMS

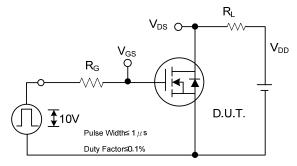


Peak Diode Recovery dv/dt Waveforms

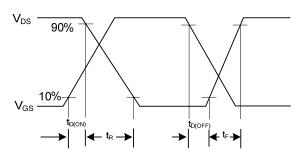


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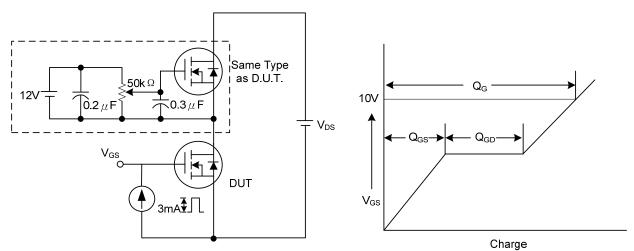
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



Switching Test Circuit

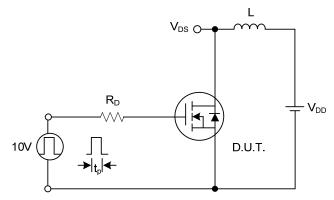


Switching Waveforms

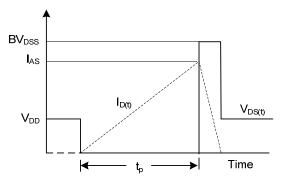


Gate Charge Test Circuit





Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



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