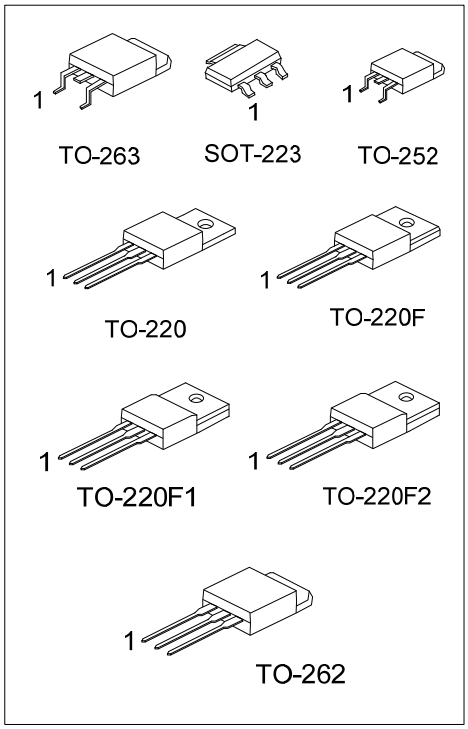
UF640

Power MOSFET

18A, 200V, 0.18OHM, N-CHANNEL POWER MOSFET



■ DESCRIPTION

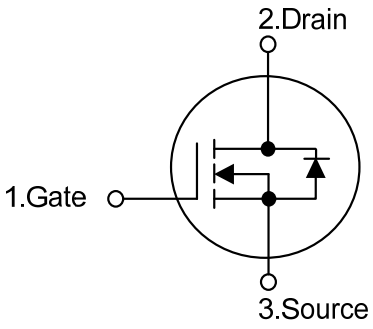
These kinds of n-channel power MOSFET field effect transistor have low conduction power loss, high input impedance, and high switching speed, Linear Transfer Characteristics, so can be use in a variety of power conversion applications.

The **UF640** suitable for resonant and PWM converter topologies.

■ FEATURES

* $R_{DS(ON)}$ < 0.18Ω @ V_{GS}=10V, I_D=10A
* Ultra Low gate charge (typical 43nC)
* Low reverse transfer capacitance (C_{RSS} = typical 100 pF)
* Fast switching capability
* Avalanche energy specified
* Improved dv/dt capability, high ruggedness

■ SYMBOL



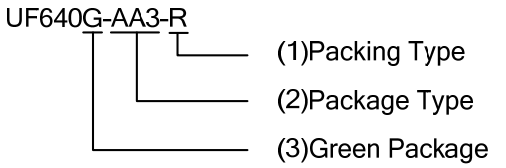
FLYING 汎翊國際有限公司 www.flying1688.com

Copyright © 2016 Unisonic Technologies Co., Ltd

■ ORDERING INFORMATION

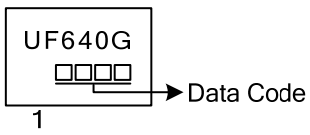
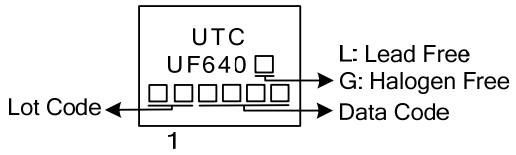
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
-	UF640G-AA3-R	SOT-223	G	D	S	Tape Reel
UF640L-TA3-T	UF640G-TA3-T	TO-220	G	D	S	Tube
UF640L-TF1-T	UF640G-TF1-T	TO-220F1	G	D	S	Tube
UF640L-TF2-T	UF640G-TF2-T	TO-220F2	G	D	S	Tube
UF640L-TF3-T	UF640G-TF3-T	TO-220F	G	D	S	Tube
UF640L-TN3-R	UF640G-TN3-R	TO-252	G	D	S	Tape Reel
UF640L-T2Q-T	UF640G-T2Q-T	TO-262	G	D	S	Tube
UF640L-T2Q-R	UF640G-T2Q-R	TO-262	G	D	S	Tape Reel
UF640L-TQ2-T	UF640G-TQ2-T	TO-263	G	D	S	Tube
UF640L-TQ2-R	UF640G-TQ2-R	TO-263	G	D	S	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) AA3: SOT-223, TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F, TN3: TO-252, T2Q: TO-262, TQ2: TO-263
(3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING

SOT-223	TO-220 / TO-220F / TO-220F1 TO-220F2 / TO-252 / TO-262 / TO-263
	

FLYING 汎翊國際有限公司 www.flying1688.com

■ ABSOLUTE MAXIMUM RATING (T_C = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Drain-Gate Voltage (R_{GS}=20kΩ)		V_{DGR}	200	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current		I_D	18	A
Pulsed Drain Current (Note 2)		I_{DM}	72	A
Single Pulse Avalanche Energy Rating (Note 2)		E_{AS}	242	mJ
Maximum Power Dissipation	SOT-223	P_D	66	W
	TO-220		123	
	TO-220F		40	
	TO-220F1/TO-220F2		42	
	TO-252		83	
	TO-262/TO-263		139	
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

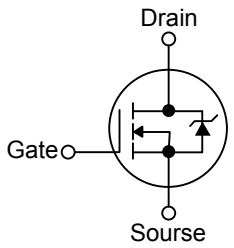
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. L=3.37mH, V_{DD}=50V, R_G=25Ω, peak I_{AS}=12A, starting T_J=25°C
3. Pulse width limited by $T_{J(MAX)}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	57	°C/W
	TO-220/TO-220F TO-220F1/TO-220F2 TO-262/TO-263		62.5	
	TO-252		110	
Junction to Case	SOT-223	θ_{JC}	1.8	°C/W
	TO-220		1.01	
	TO-220F		3.1	
	TO-220F1/TO-220F2		2.9	
	TO-252		1.5	
	TO-262/TO-263		0.9	

汎翊國際有限公司 www.flying1688.com FLYING

■ ELECTRICAL CHARACTERISTICS (T_C = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	200			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} = Rated BV_{DSS}, V_{GS} = 0V			25	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(THR)}$	V_{GS}=V_{DS}, I_D=250μA	2		4	V
Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A		0.14	0.18	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1MHz		805		pF
Output Capacitance	C_{OSS}			240		pF
Reverse Transfer Capacitance	C_{RSS}			46		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=100V,I_D≈18A, R_G=9.1Ω,R_L=5.4Ω, MOSFET Switching Times are Essentially Independent of Operating Temperature		40	52	ns
Turn-ON Rise Time	t_R			58	72	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			127	152	ns
Turn-OFF Fall-Time	t_F			86	104	ns
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=10V, I_D≈18A, V_{DS}=0.8 x Rated BV_{DSS} Gate Charge is Essentially Independent of Operating Temperature $I_{G(REF)}$ = 1.5mA		89	110	nC
Gate Source Charge	Q_{GS}			9		nC
Gate Drain Charge	Q_{GD}			24		nC
SOURCE TO DRAIN DIODE SPECIFICATIONS						
Diode Forward Voltage (Note)	V_{SD}	T_J=25°C, I_S=18A, V_{GS}=0V,			2.0	V
Continuous Source Current (body diode)	I_S	Integral Reverse p-n Junction Diode in the MOSFET			18	A
Pulse Source Current (body diode) (Note)	I_{SM}				72	A
Reverse Recovery Time	t_{rr}	T_J=25°C, I_S=18A, dI_S/dt=100A/μs	120	240	530	ns
Reverse Recovery Charge	Q_{RR}	T_J=25°C, I_S=18A, dI_S/dt=100A/μs	1.3	2.8	5.6	μC

Note: Pulse Test: Pulse width ≤ 300μs, duty cycle ≤ 2%.

FLYING 汎翊國際有限公司 www.flying1688.com

■ TEST CIRCUIT

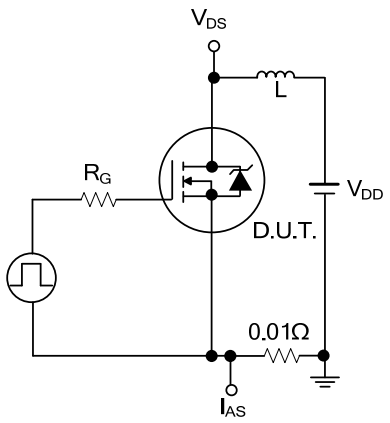


Fig. 1 Unclamped Energy Test Circuit

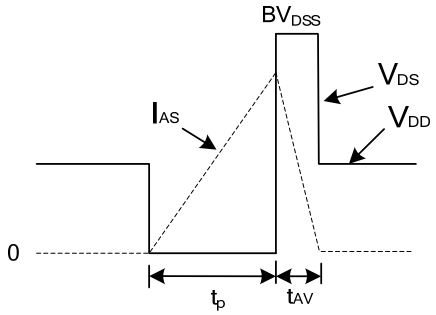


Fig.2 Unclamped Energy Waveforms

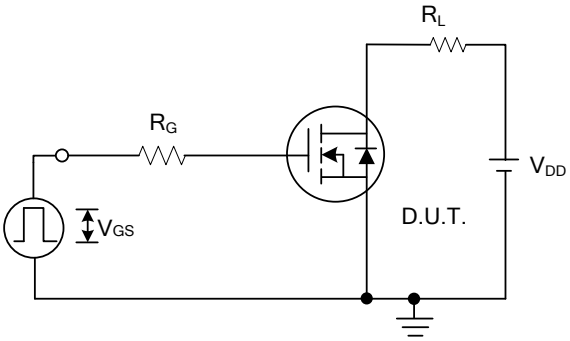


Fig.3 Switching Time Test Circuit

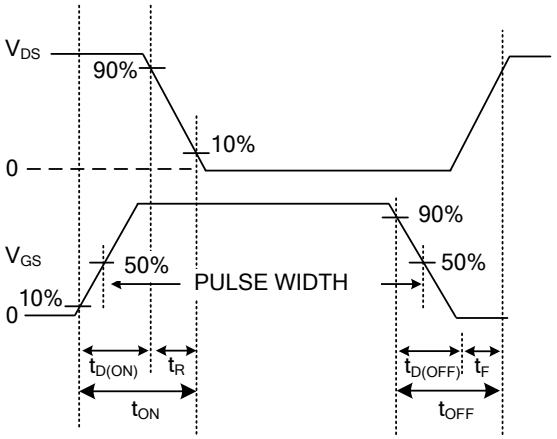


Fig.4 Resistive Switching Waveforms

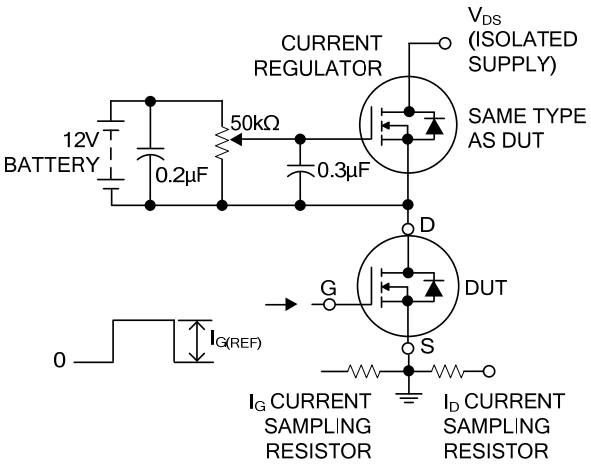


Fig.5 Gate Charge Test Circuit

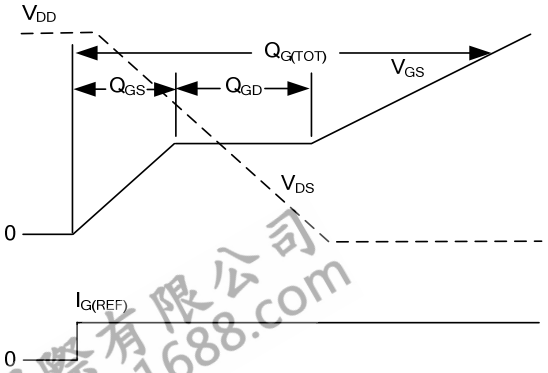
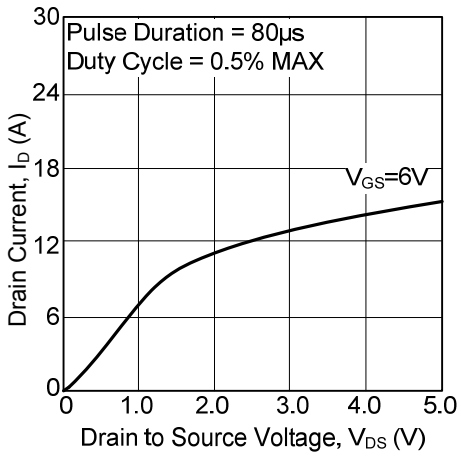


Fig.6 Gate Charge Waveforms

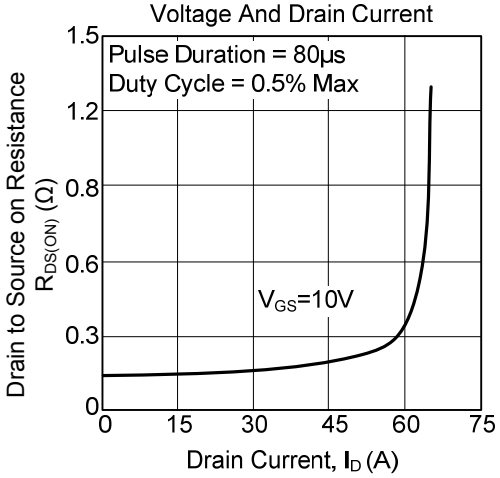
FLYING 汎翊國際有限公司 www.flying1688.com

■ TYPICAL CHARACTERISTICS

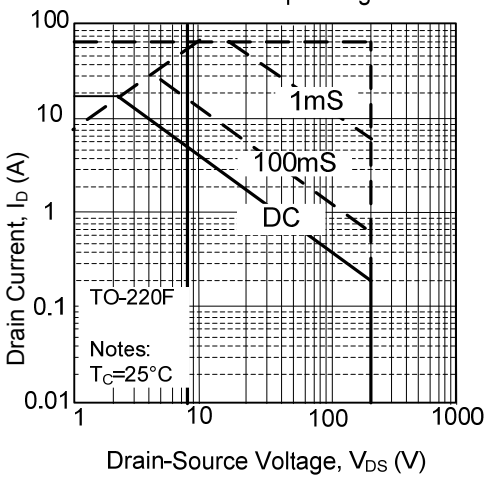
Saturation Characteristics



Drain to Source On Resistance vs. Gate Voltage And Drain Current



Maximum Safe Operating Area



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.