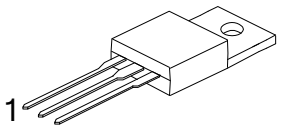
UF640-P

Power MOSFET

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



TO-220

■ DESCRIPTION

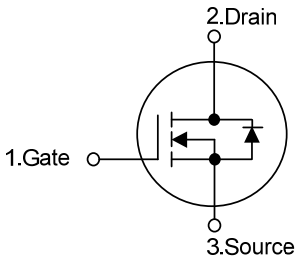
These kinds of n-channel power MOSFET field effect transistor have low conduction power loss, high input impedance, and high switching speed, Linear Transfer Characteristics, so can be use in a variety of power conversion applications.

The **UF640-P** 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



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen-Free		1	2	3	
UF640L-TA3-T	UF640G-TA3-T	TO-220	G	D	S	Tube

UF640L-TA3-T
(1)Packing Type
(2)Package Type
(3)Lead Free

(1) T: Tube
(2) TA3: TO-220
(3) L: Lead Free, G: Halogen Free

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

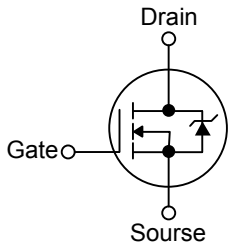
PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	200	V
Drain-Gate Voltage (R_{GS}=20kΩ)	V_{DGR}	200	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	18	A
Pulsed Drain Current (Note 2)	I_{DM}	72	A
Single Pulse Avalanche Energy Rating (Note 2)	E_{AS}	580	mJ
Maximum Power Dissipation	P_D	123	W
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Note: 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}=18A, starting T_J=25°C.
3. Pulse width limited by $T_{J(MAX)}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	1.01	°C/W

■ 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		0.13	0.17	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		26	40	ns
Turn-ON Rise Time	t_R			46	70	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			300	350	ns
Turn-OFF Fall-Time	t_F			97	120	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		34	55	nC
Gate Source Charge	Q_{GS}			5.5		nC
Gate Drain Charge	Q_{GD}			6.6		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%.

■ TEST CIRCUIT

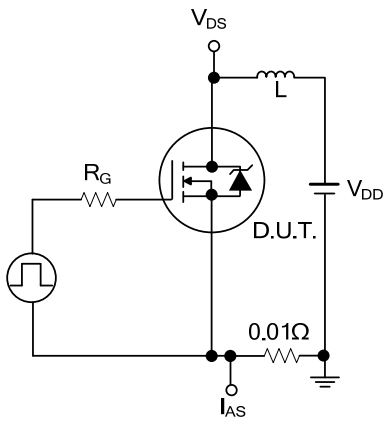


Fig. 1 Unclamped Energy Test Circuit

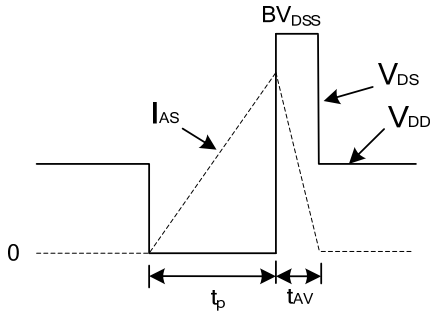


Fig.2 Unclamped Energy Waveforms

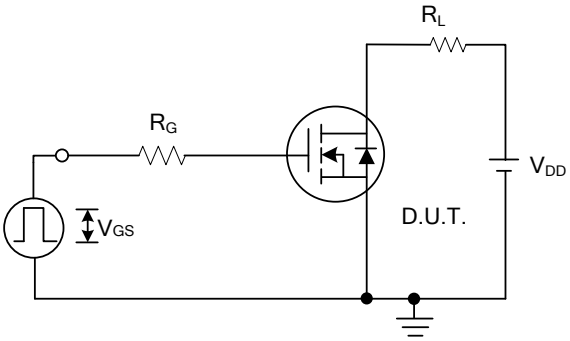


Fig.3 Switching Time Test Circuit

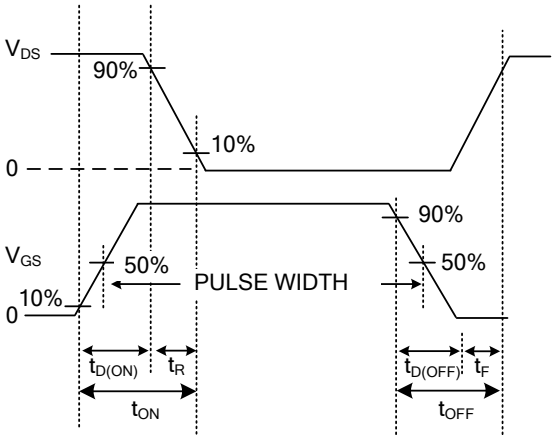


Fig.4 Resistive Switching Waveforms

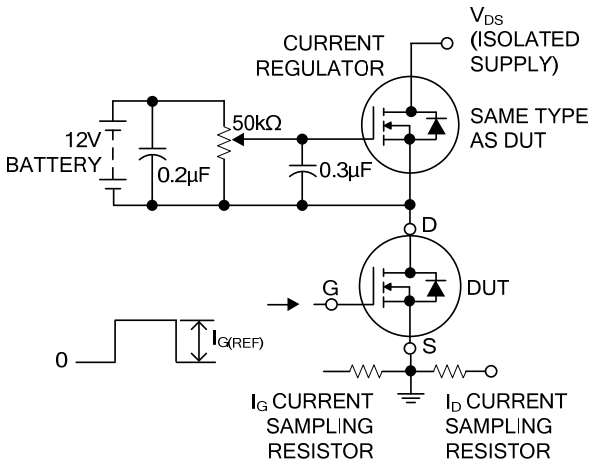


Fig.5 Gate Charge Test Circuit

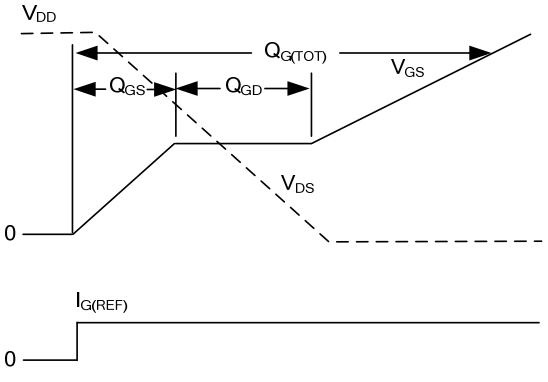


Fig.6 Gate Charge Waveforms

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