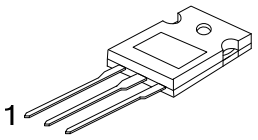
URFP064

Preliminary | ***Power MOSFET***

70A, 60V N-CHANNEL POWER MOSFET



TO-247

■ DESCRIPTION

The UTC **URFP064** is an N-channel enhancement power MOSFET using UTC's advanced technology to provide the customers with a minimum on-state resistance and high switching speed.

■ FEATURES

* $R_{DS(ON)}$<10mΩ @ V_{GS}=10V, I_D=35A
* High Switching Speed

■ ORDERING INFORMATION

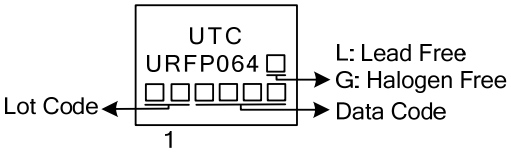
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
URFP064L-T47-T	URFP064G-T47-T	TO-247	G	D	S	Tube

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

URFP064L-T47-T

(1)Packing Type	(1) T: Tube
(2)Package Type	(2) T47: TO-247
(3)Green Package	(3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	70	A
	Pulsed (Note 2)	I_{DM}	280	
Single Pulsed Avalanche Energy		E_{AS}	1500	mJ
Power Dissipation		P_D	190	W
Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

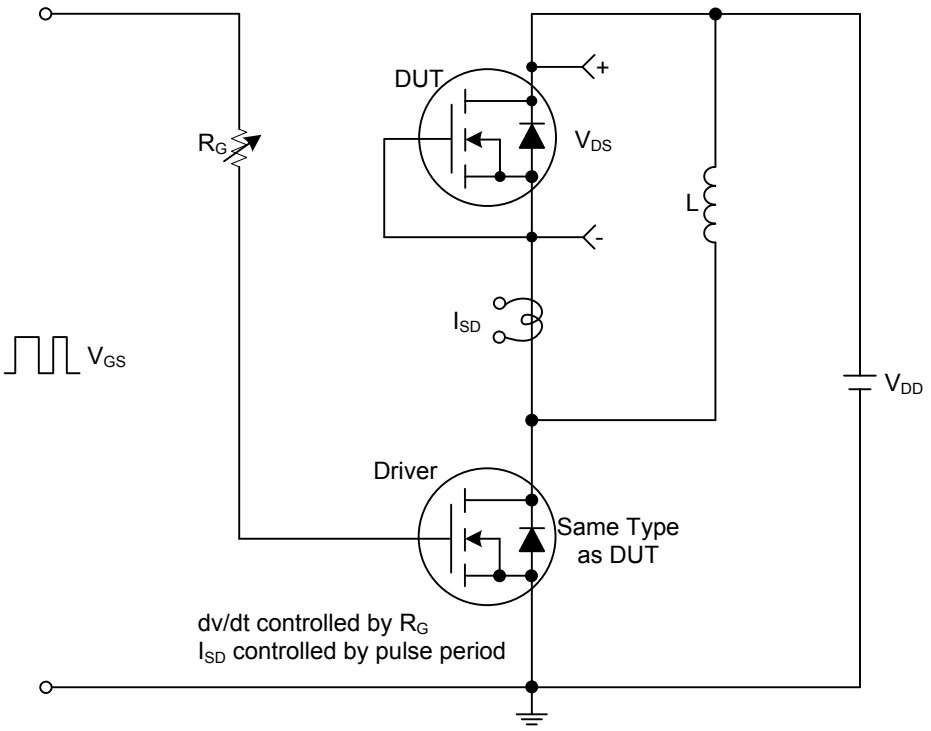
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L = 120mH, I_{AS} = 5.0A, V_{DD} = 25V, R_G = 25 Ω.

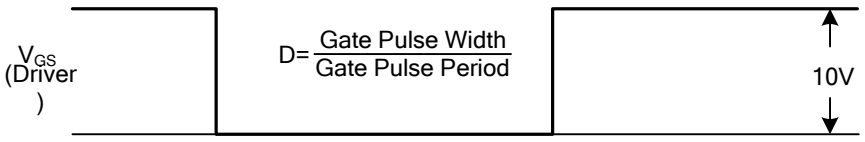
■ ELECTRICAL CHARACTERISTICS

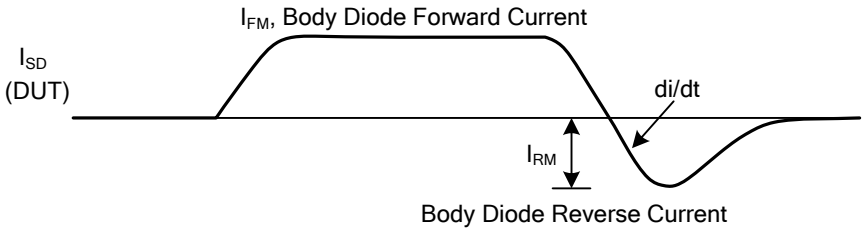
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	I_D=250μA, V_{DS}=V_{GS}	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=35A			10	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3800		pF
Output Capacitance		C_{OSS}			960		pF
Reverse Transfer Capacitance		C_{RSS}			75		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DD}=50V, V_{GS}=10V, I_D=1.3A, I_G=100μA,		265		nC
Gate to Source Charge		Q_{GS}			30		nC
Gate to Drain Charge		Q_{GD}			60		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=30V, I_D=0.5A, R_G=25Ω, V_{GS}=10V		152		ns
Rise Time		t_R			304		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			600		ns
Fall-Time		t_F			310		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				70	A
Maximum Body-Diode Pulsed Current		I_{SM}				280	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=70A, V_{GS}=0V			1.28	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S=70A, V_{GS}=0V dI_F/dt=100A/μs		74		ns
Body Diode Reverse Recovery Charge		Q_{rr}			0.2		μC

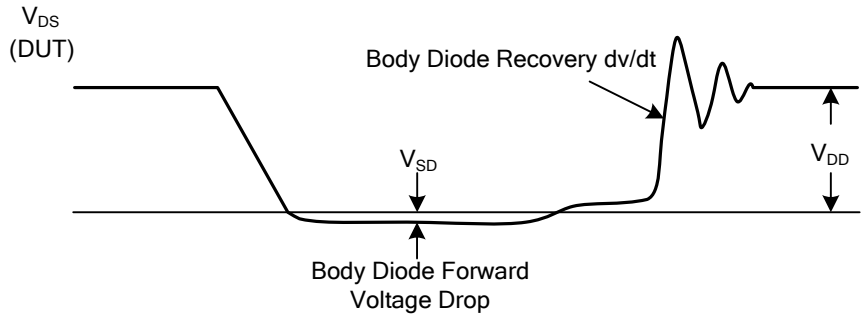
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



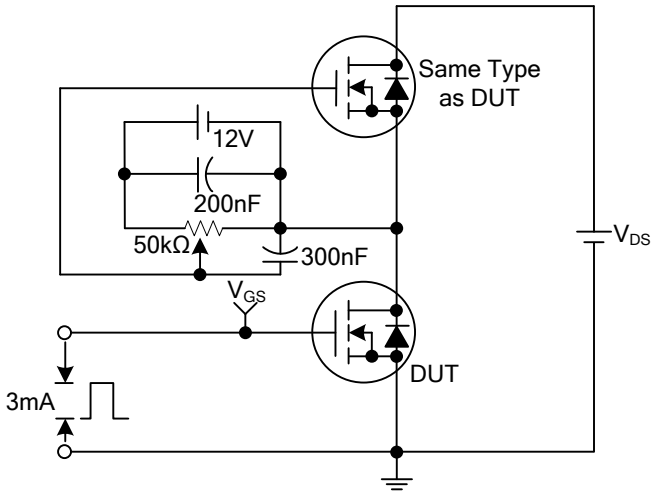




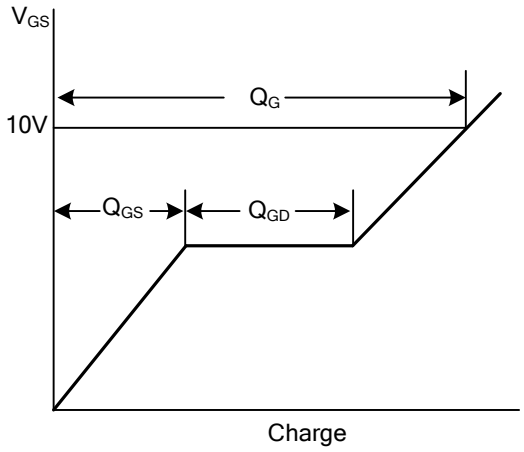


Peak Diode Recovery dv/dt Test Circuit and Waveforms

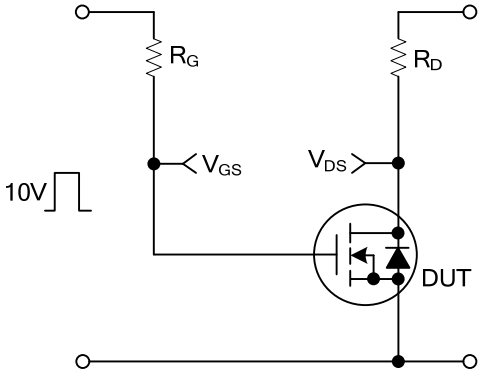
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



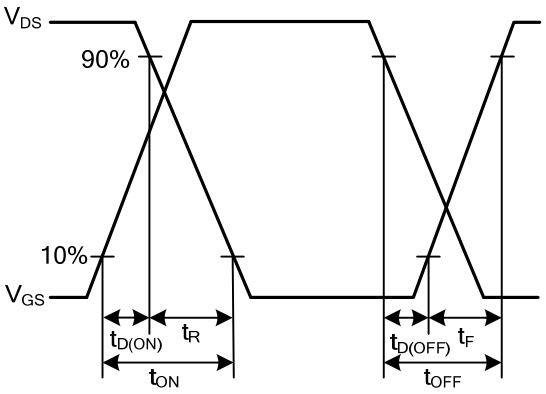
Gate Charge Test Circuit



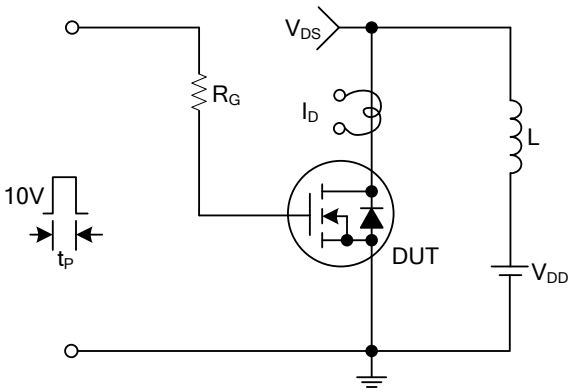
Gate Charge Waveforms



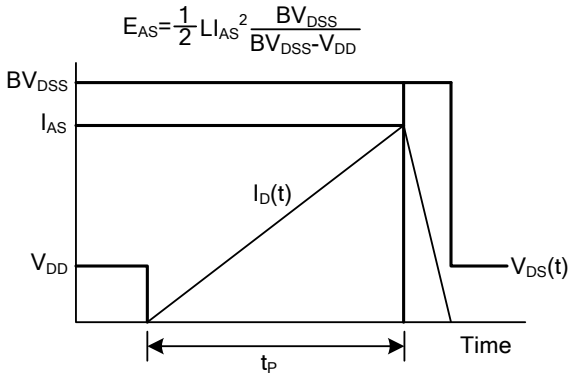
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms