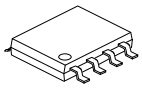
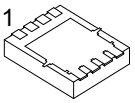
N-CHANNEL 80V (D-S) MOSFET



SOP-8



PDFN5×6

■ DESCRIPTION

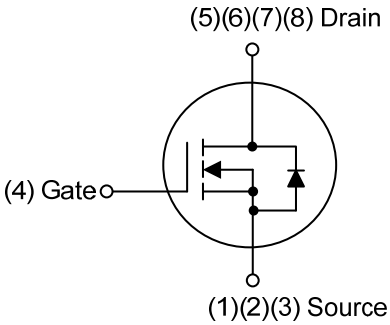
The UTC **UT7852** is an N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance and high switching speed.

The UTC **UT7852** is suitable for primary side switch for DC/DC applications.

■ FEATURES

* High switching speed
* Low on-state resistance

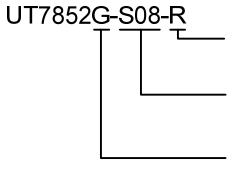
■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT7852L-S08-R	UT7852G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT7852L-P5060-R	UT7852G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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

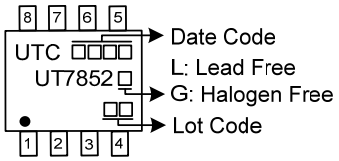
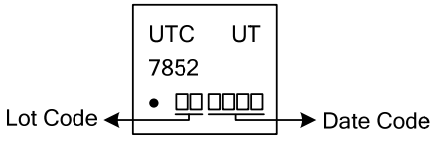


(1) R: Tape Reel

(2) S08: UT7852, P5060: PDFN5×6

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOP-8	PDFN5×6
	

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise noted)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	80	V
Gate-Source Voltage			V_{GSS}	±20	V
Pulsed Drain Current			I_{DM}	50	A
Continuous Drain Current (T_J=150°C)(Note 1)		T_A=25°C	I_D	12.5	A
		T_A=70°C		10.0	A
Avalanche Current		L=0.1mH	I_{AS}	40	A
Continuous Source Current (Diode Conduction) (Note 1)			I_S	4.7	A
Power Dissipation (Note 1)	T_A=25°C	SOP-8	P_D	1.5	W
		PDFN5×6		5.2	W
Junction Temperature			T_J	-55 ~ +150	°C
Storage Temperature Range			T_{STG}	-55 ~ +150	°C
Soldering Recommendations (Peak Temperature)				260	°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

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient (Note 1)	SOP-8	θ_{JA}			85	°C/W
	PDFN5×6			52	65	°C/W
Junction to Case (Drain)	SOP-8	θ_{JC}			24	°C/W
	PDFN5×6			1.5	1.8	°C/W

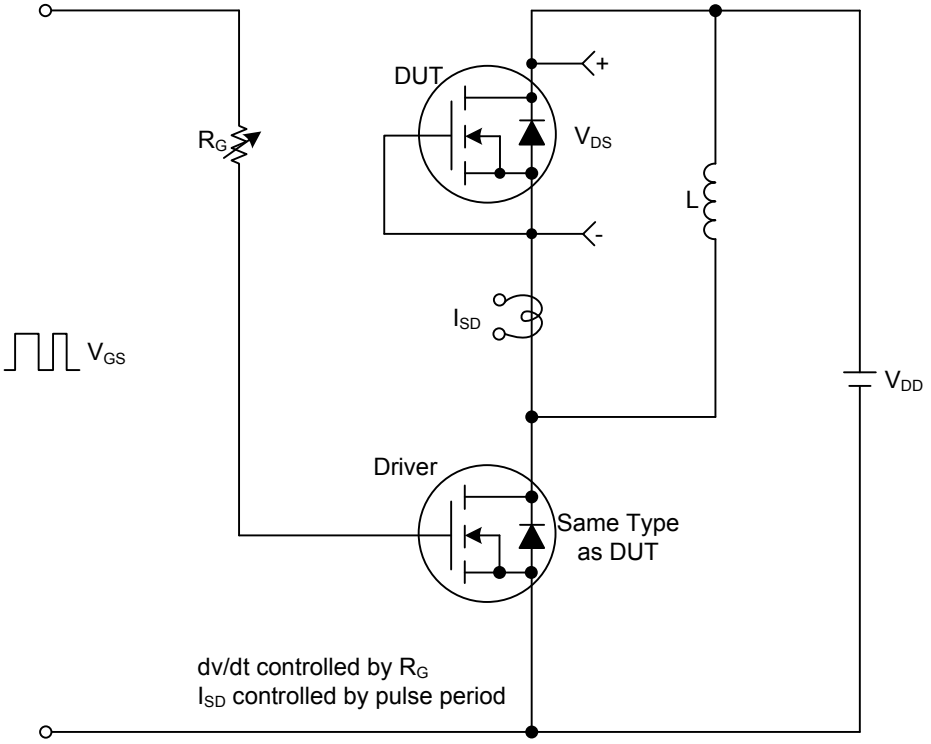
Note: Surface Mounted on 1" x 1" FR4 board.

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

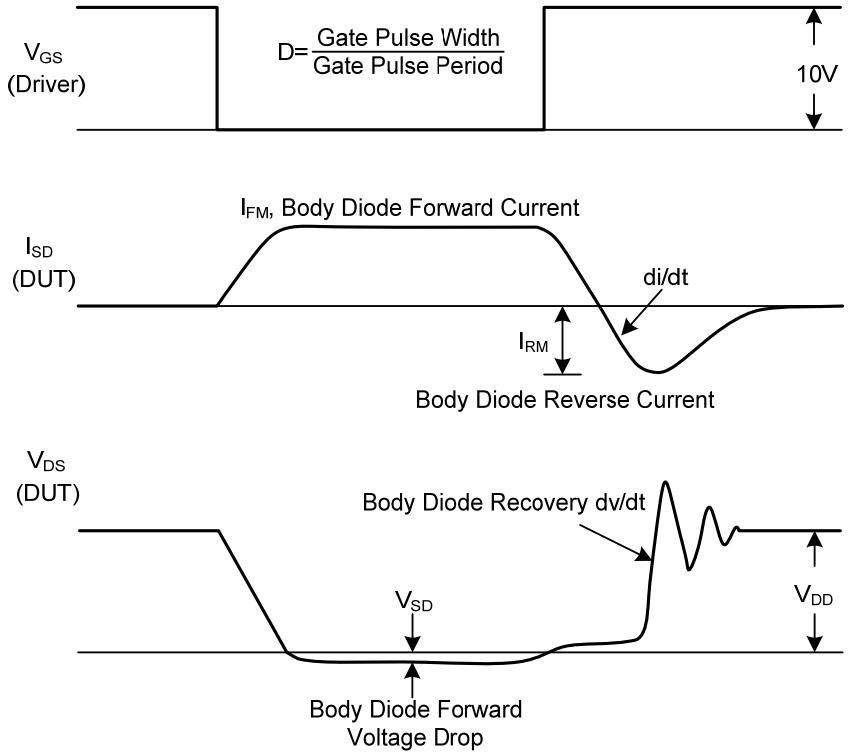
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
			V_{DS}=80V, V_{GS}=0V, T_J=55°C			5	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0			V
Static Drain-Source On-State Resistance (Note 1)		$R_{DS(ON)}$	V_{GS}=10V, I_D=10A		12.5	16.5	mΩ
			V_{GS}=6.0V, I_D=8.0A		14	22	mΩ
Forward Transconductance (Note 1)		g_{FS}	V_{DS}=15V, I_D=10A		25		S
On State Drain Current (Note 1)		$I_{D(ON)}$	V_{DS}≥5V, V_{GS}=10V	50			A
DYNAMIC PARAMETERS (Note 2)							
Gate Resistance		R_G			2		Ω
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=40V, I_D=10A		34	41	nC
Gate to Source Charge		Q_{GS}			7.5		nC
Gate to Drain Charge		Q_{GD}			11.0		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=30V, R_L=60Ω, I_D≈0.5A, V_{GEN}=10V, R_G=25Ω		120		ns
Rise Time		t_R			130		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			700		ns
Fall-Time		t_F			220		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Diode Forward Voltage (Note 1)		V_{SD}	I_S=2.8A, V_{GS}=0V		0.75	1.1	V
Source-Drain Reverse Recovery Time		t_{rr}	I_F=2.8A, dI/dt=100A/μs		45	75	ns

Notes: 1. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.

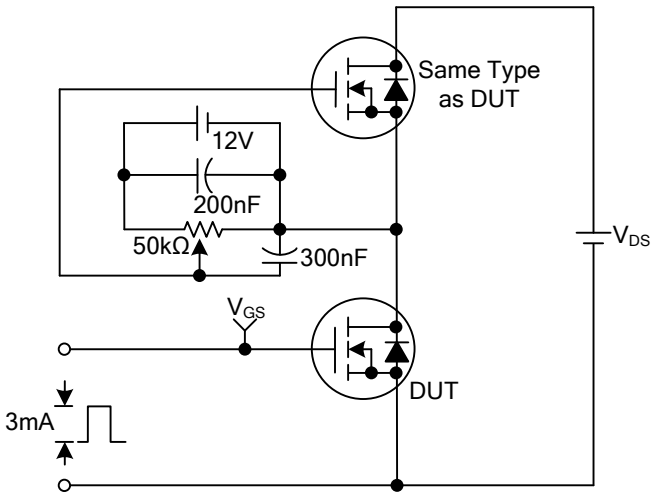
■ TEST CIRCUITS AND WAVEFORMS



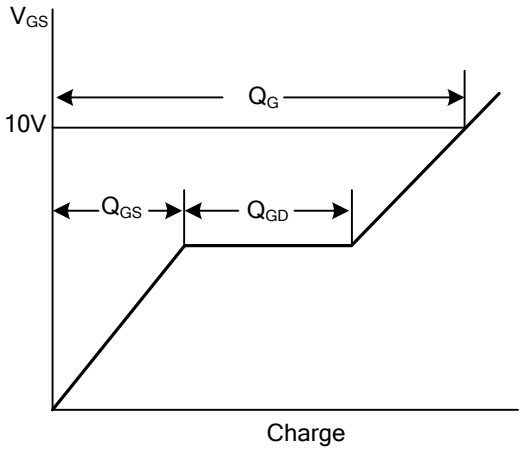
Peak Diode Recovery dv/dt Test Circuit & Waveforms



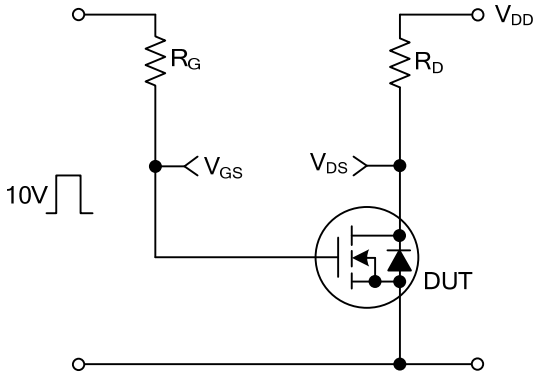
■ TEST CIRCUITS AND WAVEFORMS



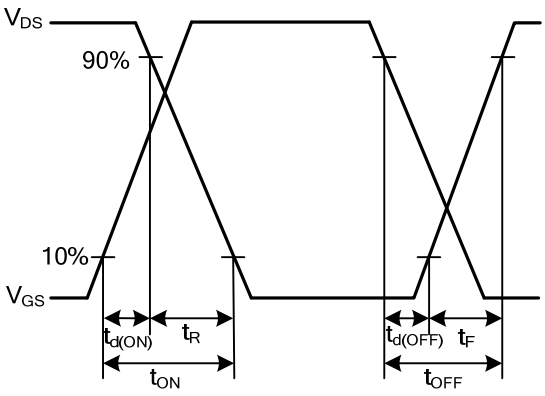
Gate Charge Test Circuit



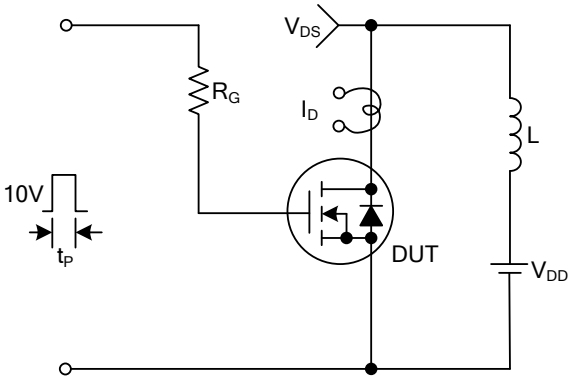
Gate Charge Waveforms



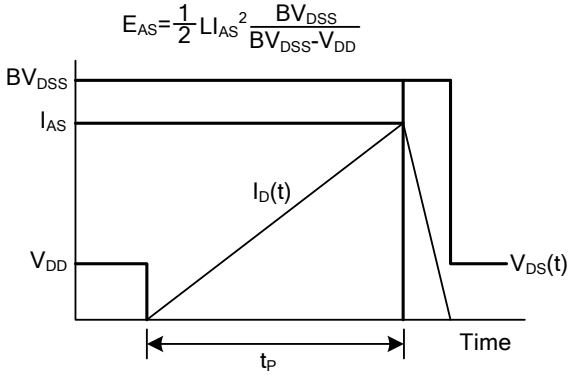
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms