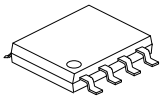
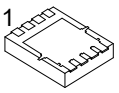
-25A, -12V P-CHANNEL POWER MOSFET



SOP-8



PDFN5×6

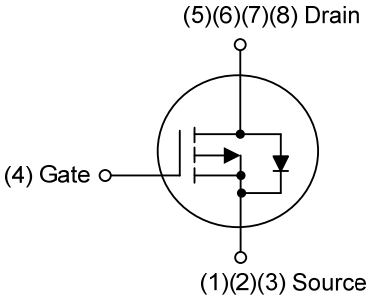
■ DESCRIPTION

The UTC **UT25P012L** is a P-channel MOS Field Effect Transistor. it uses UTC's advanced technology to provide the customers with high switching speed and a minimum on-state resistance.

■ FEATURES

* $R_{DS(ON)}$ ≤ 5.0 mΩ @ V_{GS}= -4.5V, I_D= -16A
  $R_{DS(ON)}$ ≤ 7.0 mΩ @ V_{GS}= -2.5V, I_D= -13.6A

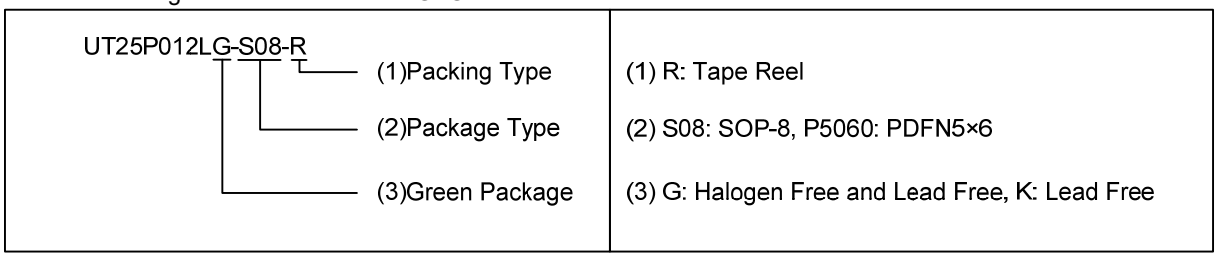
■ SYMBOL



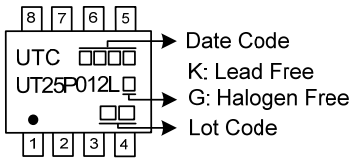
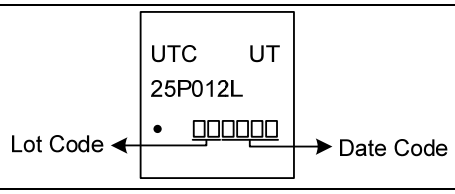
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT25P012LK-S08-R	UT25P012LG-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UT25P012LK-P5060-R	UT25P012LG-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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



■ MARKING

SOP-8	PDFN5×6
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-12	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	DC	I_D	-25	A
	Pulsed (Note 2)	I_{DM}	-50	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	338	mJ
Power Dissipation	SOP-8	P_D	7	W
	PDFN5×6		62	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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 = 1mH, I_{AS} = -26A, V_{DD} = -50V, R_G = 25Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	125	°C/W
	PDFN5×6		65	°C/W
Junction to Case	SOP-8	θ_{JC}	7	°C/W
	PDFN5×6		2	°C/W

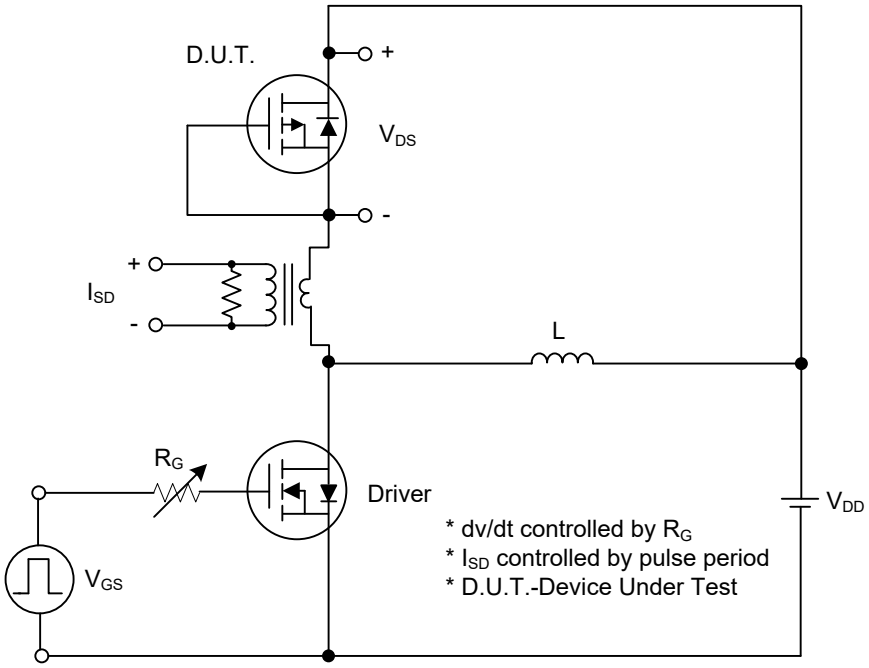
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

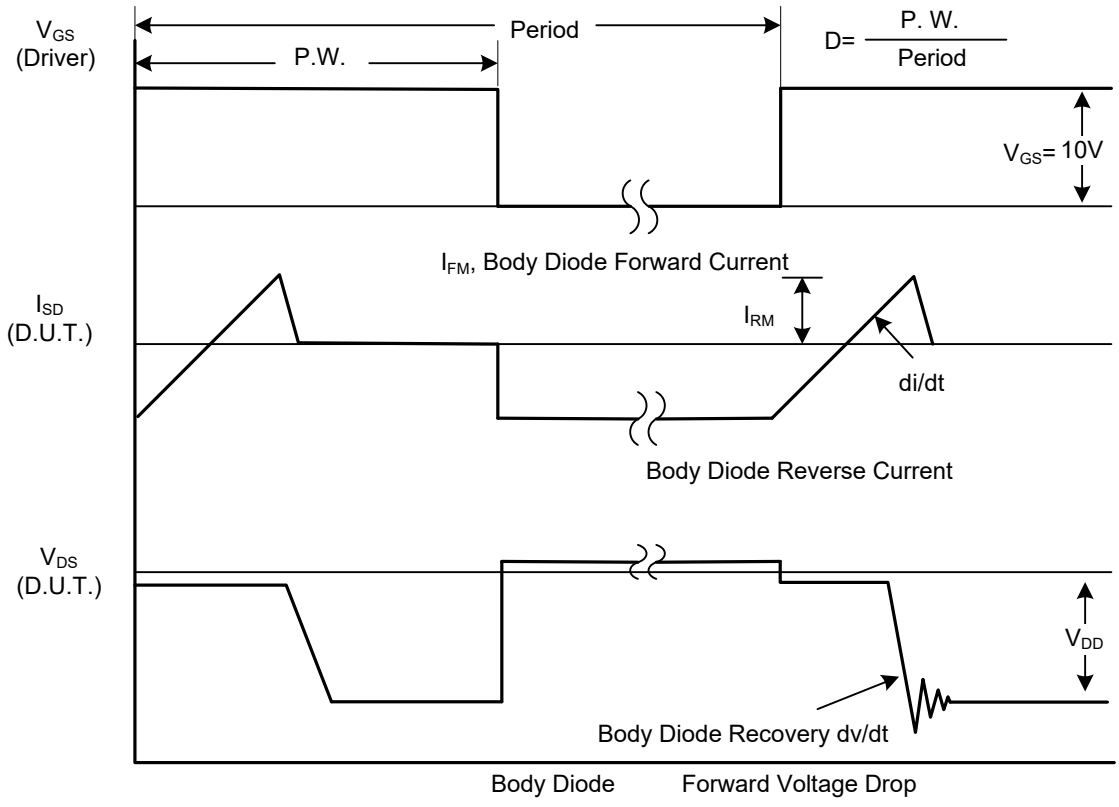
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=-250μA	-12			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-12V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+8V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-8V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=-250μA	-0.3		-1.2	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-16A			5.0	mΩ
			V_{GS}=-2.5V, I_D=-13.6A			7.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-10V, f=1.0MHz		11		nF
Output Capacitance		C_{OSS}			3.3		nF
Reverse Transfer Capacitance		C_{RSS}			2.5		nF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=-9.6V, V_{GS}=-10V, I_D=-25A (Note 1, 2)		231		nC
Gate to Source Charge		Q_{GS}			9		nC
Gate to Drain Charge		Q_{GD}			8		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS}=-6V, V_{GS}=-10V, I_D=-25A, R_G=3Ω (Note 1, 2)		15		ns
Rise Time		t_R			19		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			529		ns
Fall-Time		t_F			421		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				-25	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				-50	A
Diode Forward Voltage		V_{SD}	I_F=-25A, V_{GS}=0V			-1.4	V

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

■ TEST CIRCUITS AND WAVEFORMS

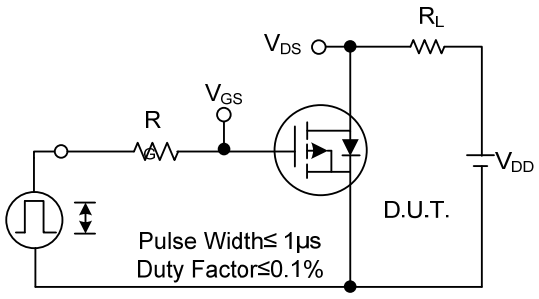


Peak Diode Recovery dv/dt Test Circuit

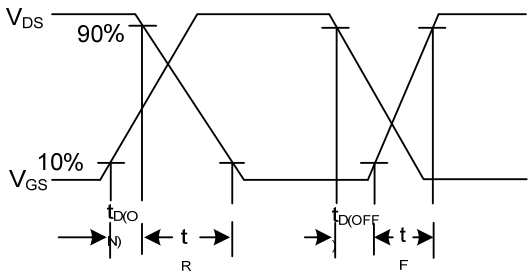


Peak Diode Recovery dv/dt Waveforms

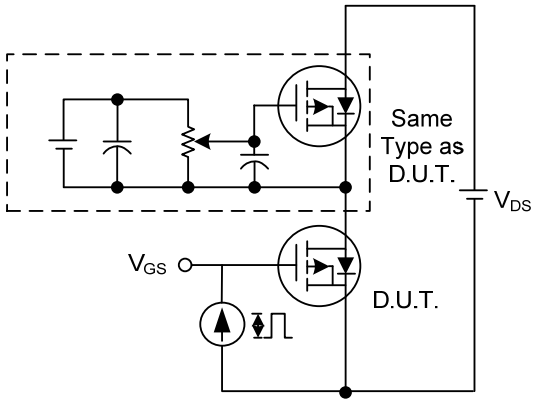
■ TEST CIRCUITS AND WAVEFORMS



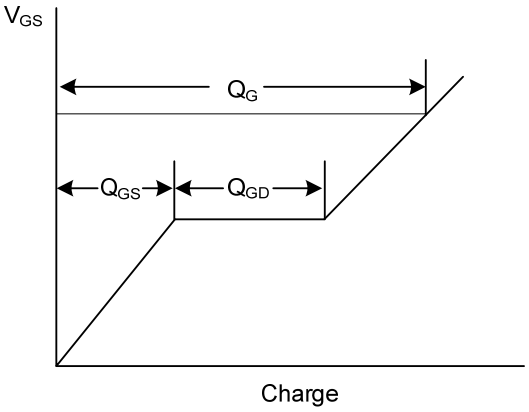
Switching Test Circuit



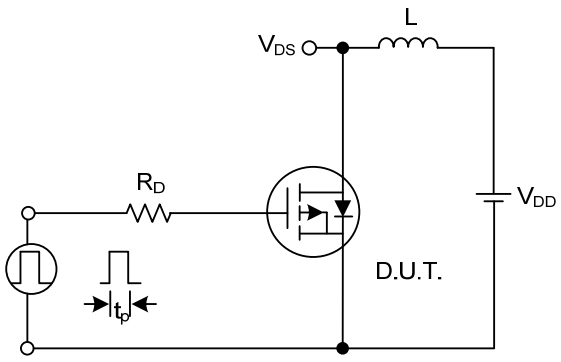
Switching Waveforms



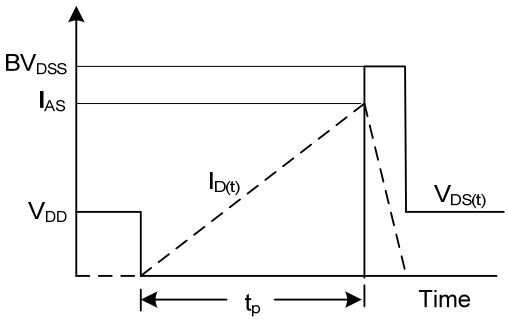
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms