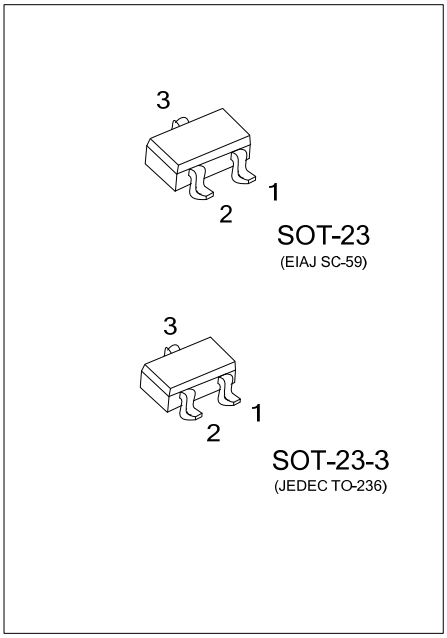
UT6302

Power MOSFET

P-CHANNEL ENHANCEMENT MOSFET



■ DESCRIPTION

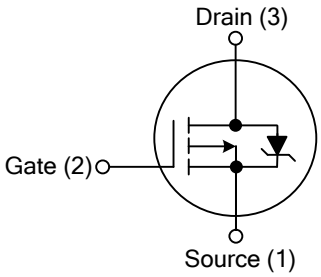
The UTC **UT6302** is a power MOSFET offering the customers efficient and reliable performance.

The UTC **UT6302** is ideal for thin application environments, such as portable electronics and PCMCIA cards.

■ FEATURES

* Extremely-Low On-Resistance
* Fast Switching Speed

■ SYMBOL

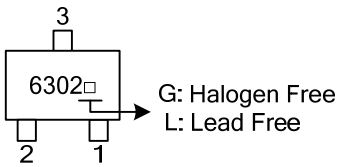


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT6302L-AE2-R	UT6302G-AE2-R	SOT-23-3	S	G	D	Tape Reel
UT6302L-AE3-R	UT6302G-AE3-R	SOT-23	S	G	D	Tape Reel

UT6302L-AE3-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) AE2: SOT-23-3, AE3: SOT-23 (3) G: Halogen Free, L: Lead Free

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_J = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current (V_{GS}=-4.5V, Ta=25°C)	I_D	-0.78	A
Pulsed Drain Current (Note 2)	I_{DM}	-4.9	A
Peak Diode Recovery dv/dt (Note 3)	dv/dt	-5.0	V/nS
Power Dissipation (T_A=25°C)	P_D	540	mW
Linear Derating Factor above 25°C		4.3	mW /°C
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. Pulse width limited by $T_{J(MAX)}$
3. I_{SD}≤-0.61A, di/dt≤76A/μs, V_{DD}≤$V_{(BR)DSS}$, T_J=150°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	230	°C/W

Note: Surface Mounted on FR-4 Board, t ≤ 5sec.

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

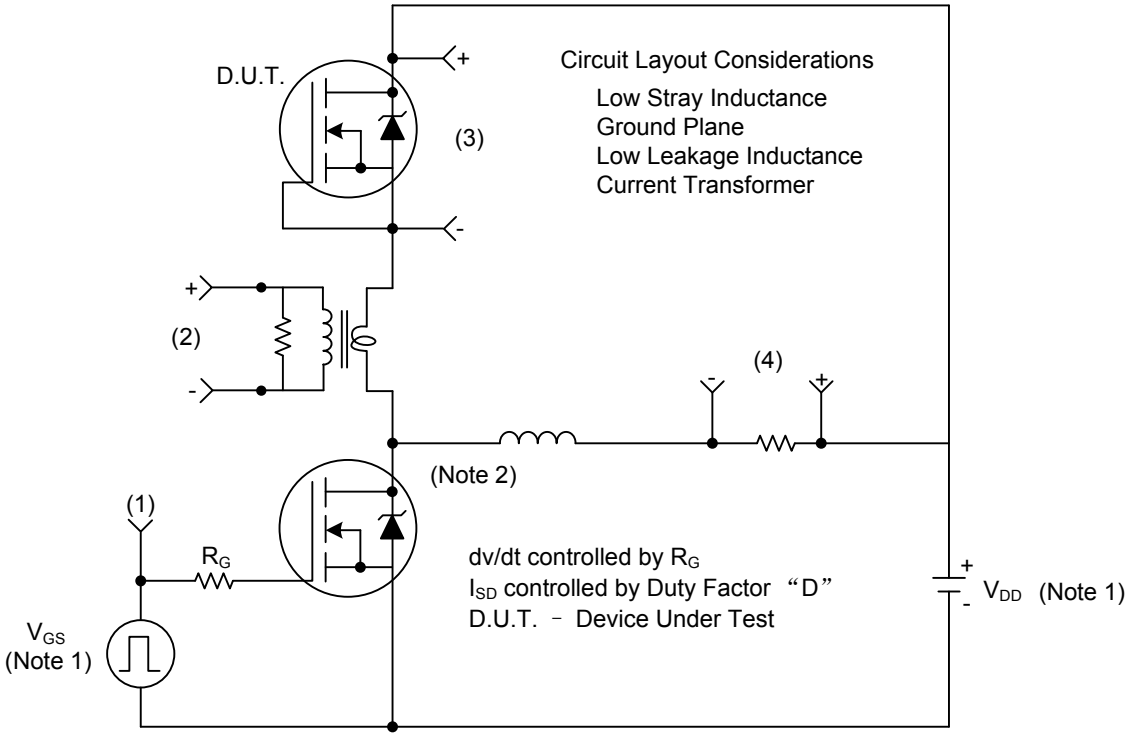
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0 V, I_D=-250 μA	-20			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-16V,V_{GS}=0V			-1.0	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12 V, V_{DS}=0 V			±100	nA
Drain-Source Breakdown Voltage	$\triangle BV_{DSS}/\triangle T_J$	I_D=-1mA, Reference to 25°C		-4.9		mV/°C
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} =V_{GS}, I_D=-250μA	-0.70		-1.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-0.61A (Note 2)			0.60	Ω
		V_{GS}=-2.7V, I_D=-0.31A (Note 2)			0.90	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-15V, V_{GS}=0V, f=1.0MHz		97		pF
Output Capacitance	C_{OSS}			53		pF
Reverse Transfer Capacitance	C_{RSS}			28		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{GS}=-4.5V, V_{DS}=-16V I_D=-0.61A (Note 1, 2)		2.4	3.6	nC
Gate Source Charge	Q_{GS}			0.56	0.84	nC
Gate Drain Charge	Q_{GD}			1.0	1.5	nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=-10V, I_D=-0.61A, R_G=6.2Ω, R_D=16Ω (Note 1, 2)		13		nS
Turn-ON Rise Time	t_R			18		nS
Turn-OFF Delay Time	$t_{D(OFF)}$			22		nS
Turn-OFF Fall-Time	t_F			22		nS

■ ELECTRICAL CHARACTERISTICS (Cont.)

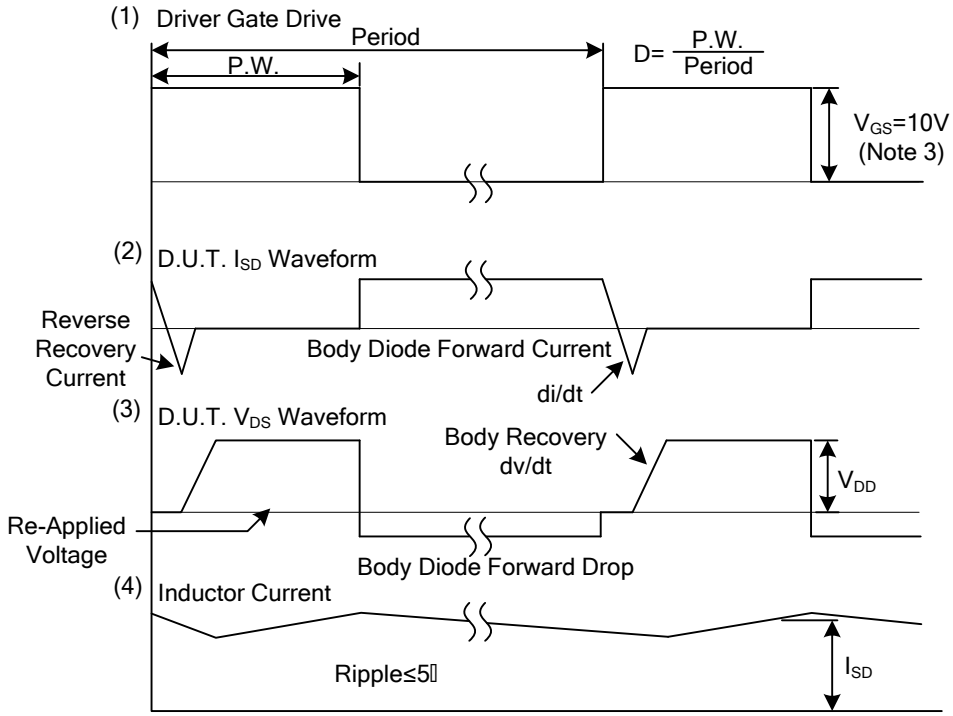
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=-0.61A, V_{GS}=0V			-1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				-0.54	A
Maximum Pulsed Drain-Source Diode Forward Current (Note 1)	I_{SM}				-4.9	A
Reverse Recovery Time	t_{rr}	T_J=25°C ,I_F=-0.61A,		35	53	nS
Reverse Recovery Charge	Q_{RR}	di/dt=100A/μs (Note 2)		26	39	nC

Notes: 1. Repetitive Rating; Pulse width limited by $T_{J(MAX)}$
2. Pulse Width ≤300μs, Duty Cycle ≤2%.

■ TEST CIRCUITS AND WAVEFORMS



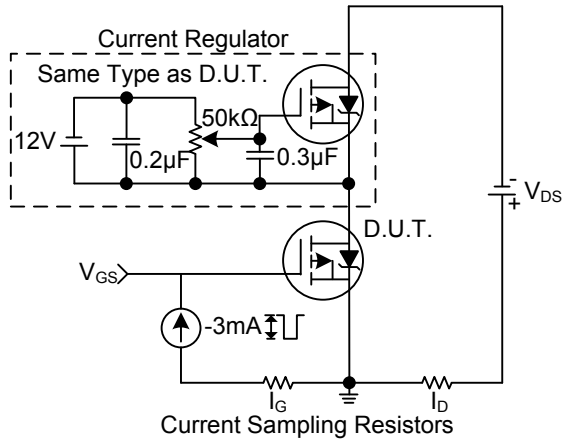
Peak Diode Recovery dv/dt Test Circuit



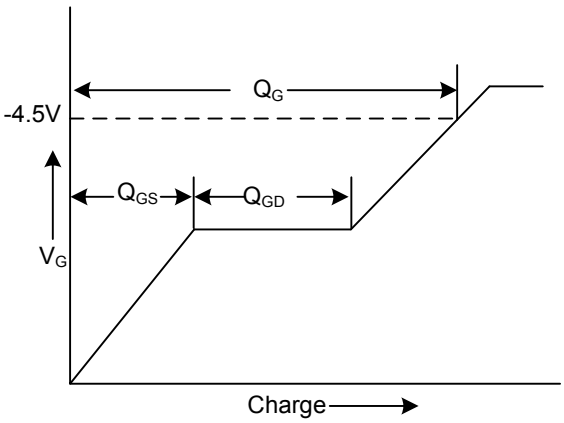
Peak Diode Recovery dv/dt Waveforms

Notes: 1. Reverse Polarity for P-Channel
2. Use P-Channel Driver for P-Channel Measurements
3. V_{GS}=5.0V for Logic Level and 3V Drive Devices

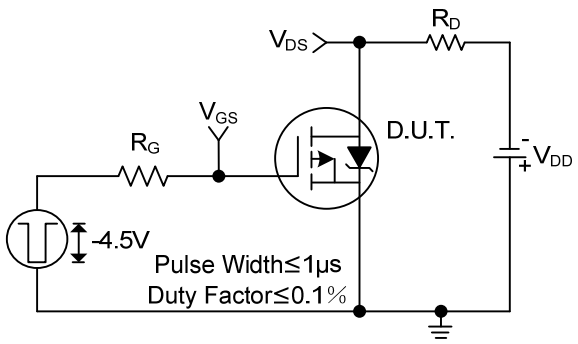
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



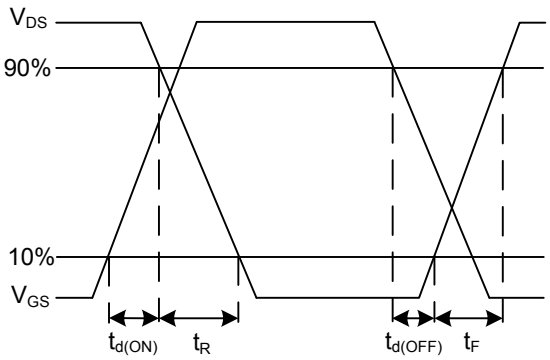
Gate Charge Test Circuit



Gate Charge Waveforms



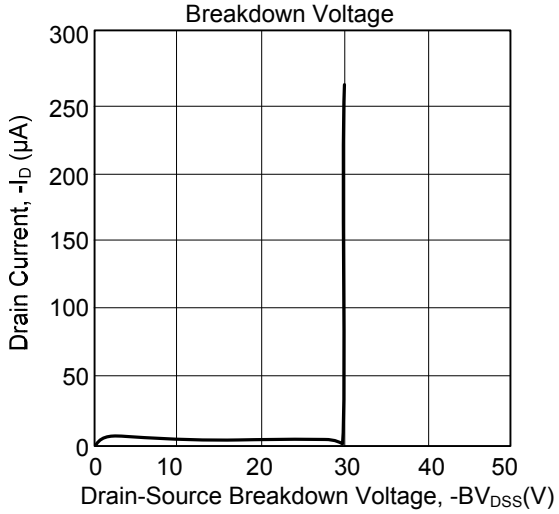
Switching Time Test Circuit



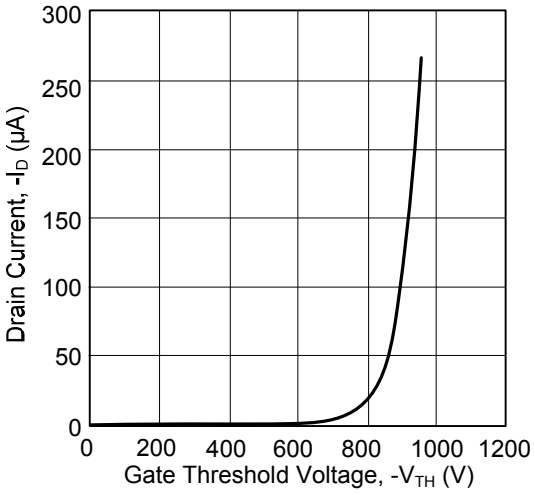
Switching Time Waveforms

■ TYPICAL CHARACTERISTICS

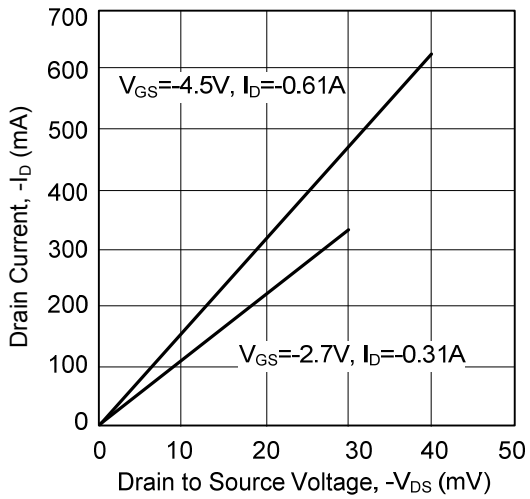
Drain Current vs. Drain-Source Breakdown Voltage



Drain Current vs. Gate Threshold Voltage



Drain-Source On-State Resistance Characteristics



Drain Current vs. Source to Drain Voltage