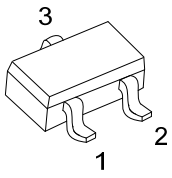
1.5A, 100V N-CHANNEL LOGIC LEVEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



SOT-23
(EIAJ SC-59)

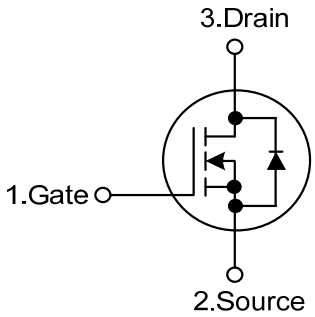
■ DESCRIPTION

The UTC **1D5N10** is a N-channel MOSFET, it uses UTC's advanced technology to provide the customers with high switch speed and low gate charge.

■ FEATURES

* $R_{DS(ON)} \leq 0.6\ \Omega$ @ V_{GS}=10V, I_D=0.75A
* High switch speed
* Low gate charge

■ SYMBOL



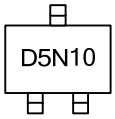
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
1D5N10L-AE3-R	1D5N10G-AE3-R	SOT-23	G	S	D	Tape Reel

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

1D5N10G-AE3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	100	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous (Note 1)	T_A=25°C	I_D	1.5	A
		T_A=70°C		1.2	A
	Pulsed (Note 2)		I_{DM}	6	A
Power Dissipation (Note 1)	T_A=25°C		P_D	1.25	W
	T_A=70°C			0.8	W
Junction Temperature			T_J	-55 ~ +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.

■ THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	100	°C/W

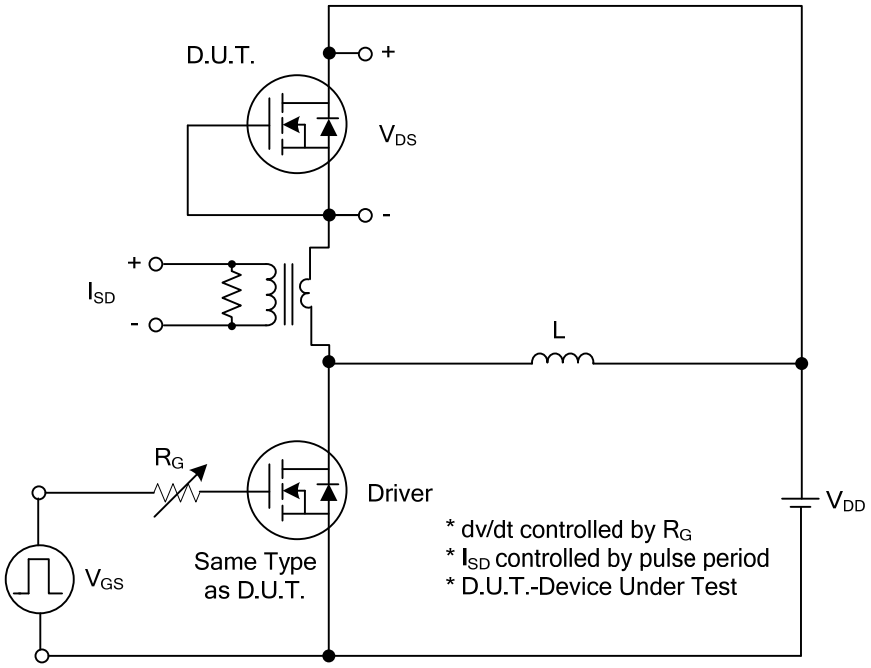
Note: The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

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

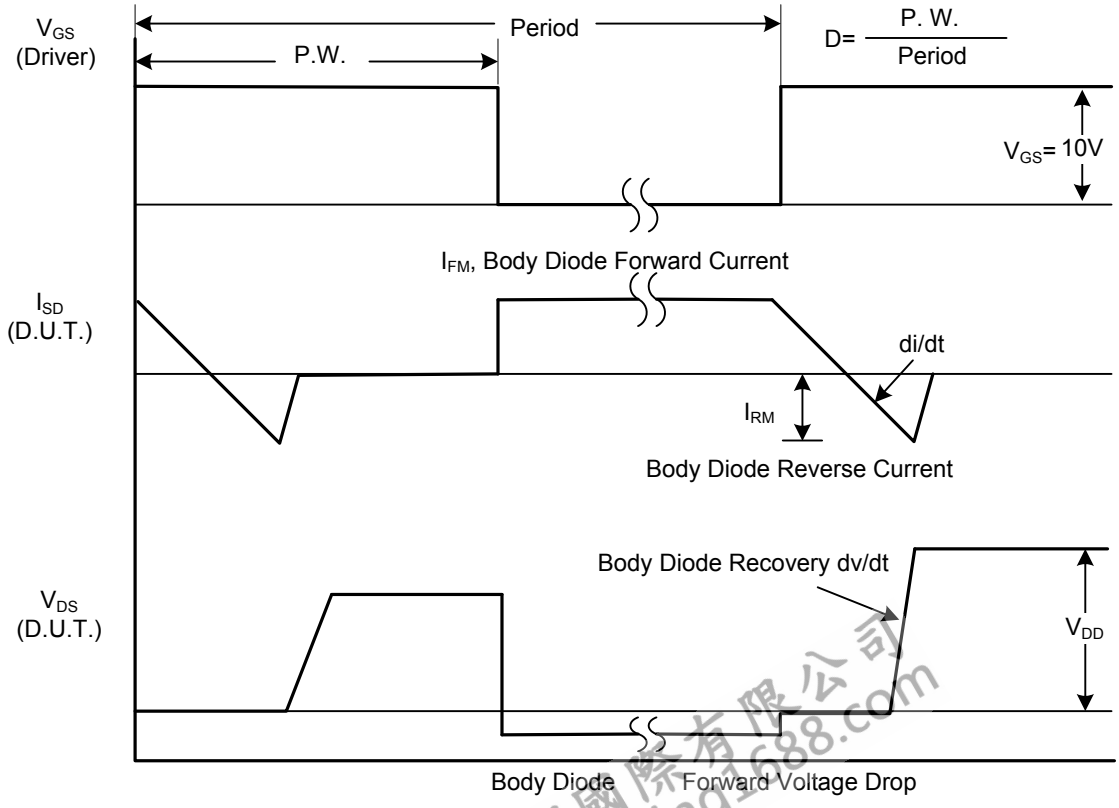
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.8		1.2	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=0.75A			0.6	Ω
DYNAMIC PARAMETERS (Note 3)							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		170		pF
Output Capacitance		C_{OSS}			34		pF
Reverse Transfer Capacitance		C_{RSS}			8.2		pF
SWITCHING PARAMETERS (Note 3)							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=50V, I_D=1.3A I_G=100μA		10		nC
Gate to Source Charge		Q_{GS}			0.7		nC
Gate to Drain Charge		Q_{GD}			0.3		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=30V, I_D=0.5A, R_{GEN}=25Ω, V_{GS}=10V		8		ns
Rise Time		t_R			14		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			86		ns
Fall-Time		t_F			60		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Continuous Drain-Source Current		I_S				1.5	A
Pulsed Drain-Source Current		I_{SM}				6.0	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=1.5A, V_{GS}=0V		0.8	1.2	V

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

■ TEST CIRCUITS AND WAVEFORMS

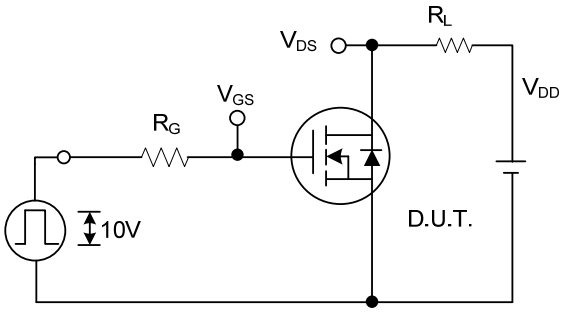


Peak Diode Recovery dv/dt Test Circuit

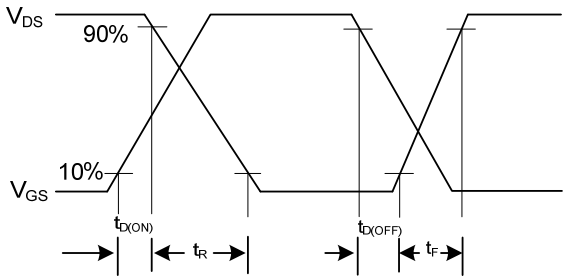


Peak Diode Recovery dv/dt Waveforms

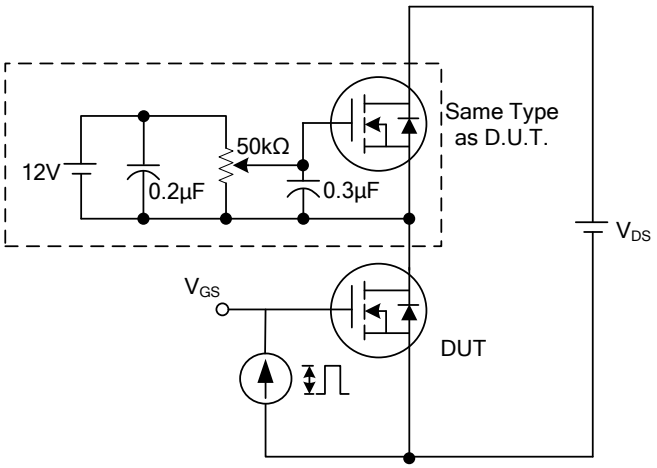
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



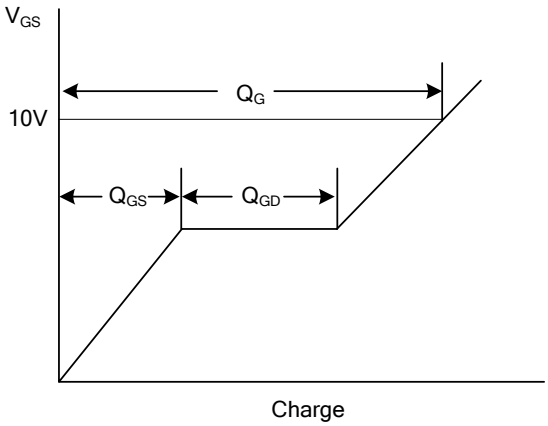
Switching Test Circuit



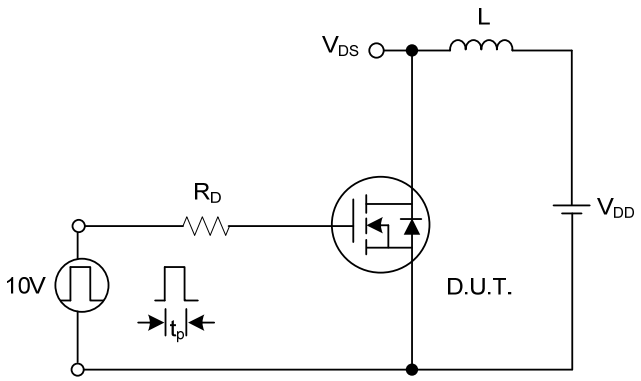
Switching Waveforms



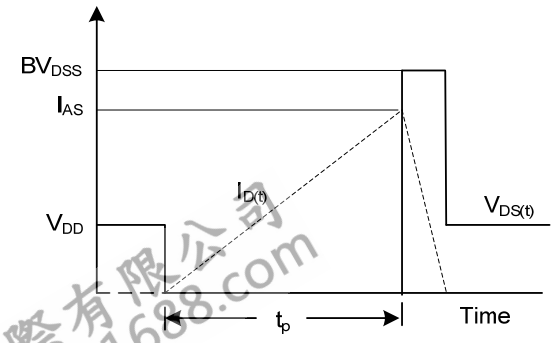
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms