



UT2N10

Power MOSFET

2A,100V N-CHANNEL POWER MOSFET

■ DESCRIPTION

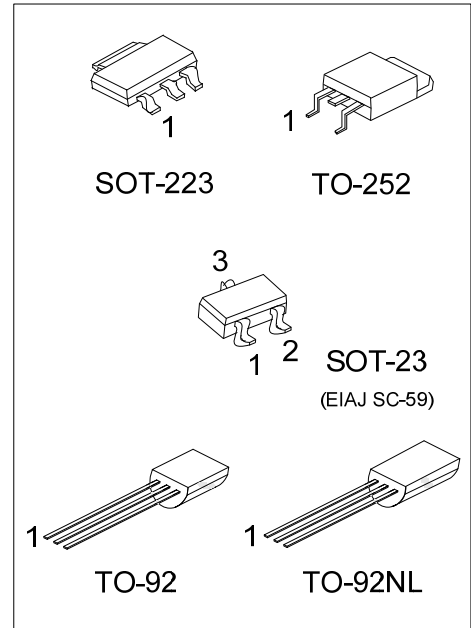
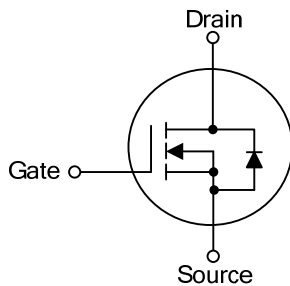
The UTC **UT2N10** is N-Channel enhancement mode silicon gate power FET. It uses a special gate oxide designed to provide full rated conductance at gate biases through 3V ~ 5V and facilitate true on-off power control directly from logic circuit supply voltages.

The UTC **UT2N10** is universally applied in logic level (5V) driving sources, such as automotive switching, solenoid drivers and programmable controllers.

■ FEATURES

- * $R_{DS(ON)} \leq 0.25 \Omega$ @ $V_{GS} = 10V$, $I_D = 2.0A$
 $R_{DS(ON)} \leq 0.32 \Omega$ @ $V_{GS} = 4.5V$, $I_D = 2.0A$
- * Design Optimized for 5V Gate Drives
- * Can be Driven Directly from QMOS, NMOS, TTL Circuits
- * Compatible with Automotive Drive Requirements
- * SOA is Power Dissipation Limited
- * Nanosecond Switching Speeds
- * Linear Transfer Characteristics
- * High Input Impedance
- * Majority Carrier Device

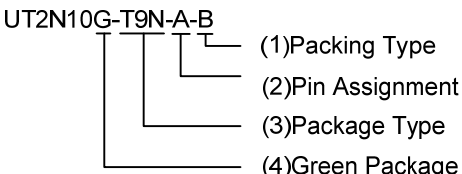
■ SYMBOL



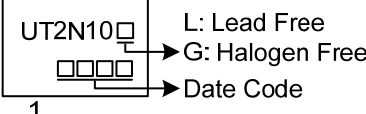
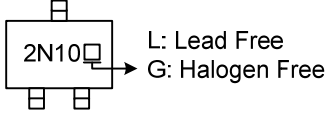
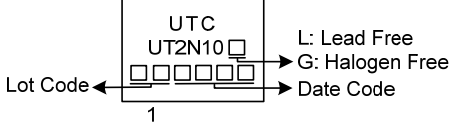
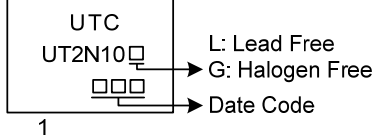
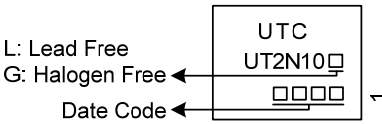
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT2N10L-AA3-R	UT2N10G-AA3-R	SOT-223	G	D	S	Tape Reel
UT2N10L-AE3-R	UT2N10G-AE3-R	SOT-23	G	S	D	Tape Reel
UT2N10L-TN3-R	UT2N10G-TN3-R	TO-252	G	D	S	Tape Reel
UT2N10L-T92-B	UT2N10G-T92-B	TO-92	G	D	S	Tape Box
UT2N10L-T92-K	UT2N10G-T92-K	TO-92	G	D	S	Bulk
UT2N10L-T9N-B	UT2N10G-T9N-B	TO-92NL	G	D	S	Tape Box
UT2N10L-T9N-K	UT2N10G-T9N-K	TO-92NL	G	D	S	Bulk
UT2N10L-T9N-A-B	UT2N10G-T9N-A-B	TO-92NL	S	D	G	Tape Box
UT2N10L-T9N-A-K	UT2N10G-T9N-A-K	TO-92NL	S	D	G	Bulk

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

 UT2N10G-T9N-A-B (1) Packing Type (2) Pin Assignment (3) Package Type (4) Green Package	(1) R: Tape Reel, B: Tape Box, K: Bulk (2) refer to Pin Assignment (for TO-92NL) (3) AA3: SOT-223, AE3: SOT-23, TN3: TO-252, T92: TO-92, T9N: TO-92NL (4) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
SOT-223	 UT2N10 1 L: Lead Free G: Halogen Free Date Code
SOT-23	 2N10 1 L: Lead Free G: Halogen Free
TO-252	 UTC UT2N10 1 Lot Code L: Lead Free G: Halogen Free Date Code
TO-92	 UTC UT2N10 1 L: Lead Free G: Halogen Free Date Code
TO-92NL	 UTC UT2N10 1 L: Lead Free G: Halogen Free Date Code

■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage (Note 1)		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous	I_{D}	2	A
	Pulsed (Note 3)	I_{DM}	4	A
Power Dissipation	SOT-223	P_{D}	0.7	W
	SOT-23		0.5	W
	TO-252		2	W
	TO-92/ TO-92NL		0.6	W
Junction Temperature		T_{J}	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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 DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	178	$^{\circ}\text{C/W}$
	SOT-23		250	$^{\circ}\text{C/W}$
	TO-252		62.5	$^{\circ}\text{C/W}$
	TO-92/ TO-92NL		208	$^{\circ}\text{C/W}$

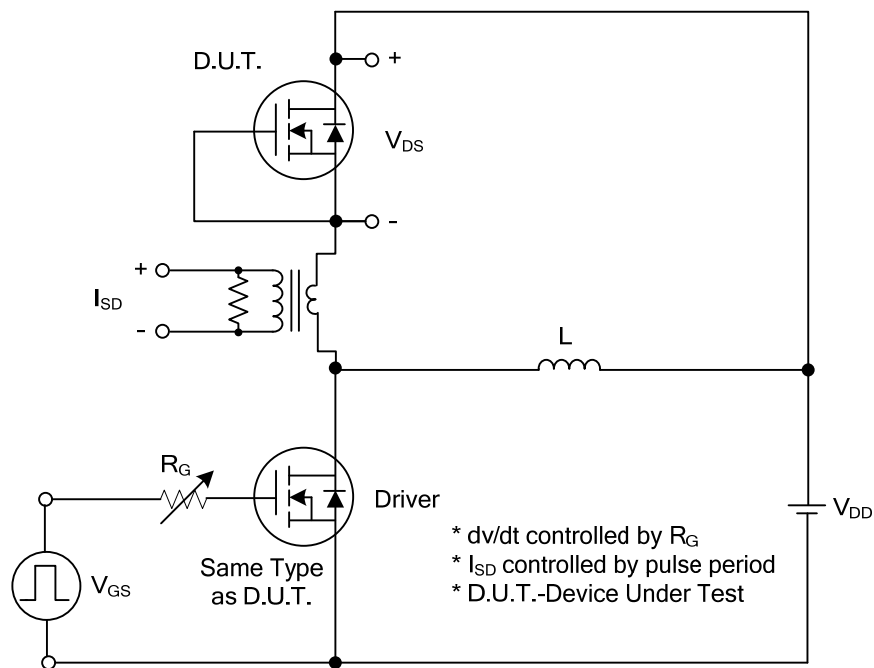
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS ($T_{\text{J}} = 25^{\circ}\text{C}$, unless otherwise specified)

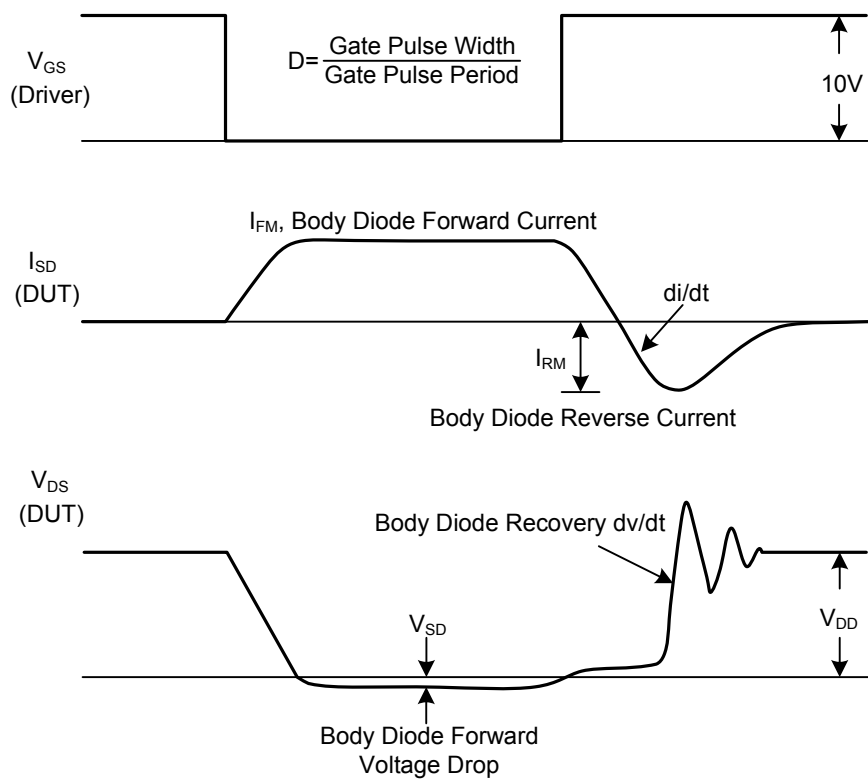
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.5		1.5	V
Drain to Source On-state Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.0A			0.25	Ω
		V _{GS} =4.5V, I _D =2.0A			0.32	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f =1.0MHz		165		pF
Output Capacitance	C _{OSS}			21		pF
Reverse Transfer Capacitance	C _{RSS}			15		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note)	Q _G	V _{DS} =80V, V _{GS} =10V, I _D =2.0A I _G =1mA (Note 1, 2)		10		nC
Gate Source Charge	Q _{GS}			2.5		nC
Gate Drain Charge	Q _{GD}			2		nC
Turn-ON Delay Time (Note)	t _{D(ON)}	V _{DS} =50V, V _{GS} =10V, I _D =0.3A, R _G =3Ω (Note 1, 2)		5		ns
Turn-ON Rise Time	t _R			14		ns
Turn-OFF Delay Time	t _{D(OFF)}			13		ns
Turn-OFF Fall-Time	t _F			10		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				2	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				4	A
Drain-Source Diode Forward Voltage (Note)	V _{SD}	I _S =2A, V _{GS} =0V			1.4	V

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

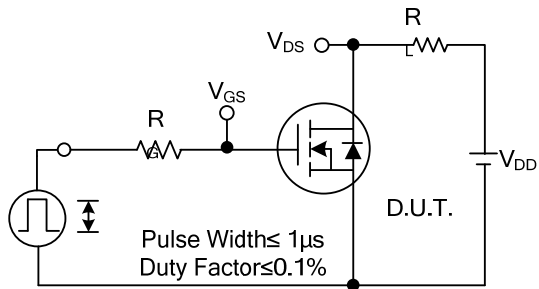


Peak Diode Recovery dv/dt Test Circuit

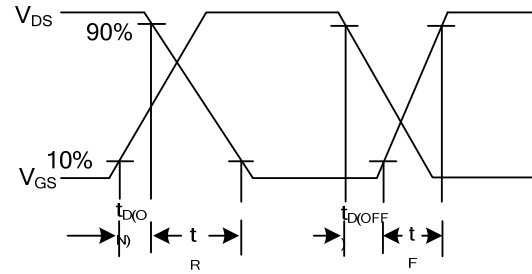


Peak Diode Recovery dv/dt Waveforms

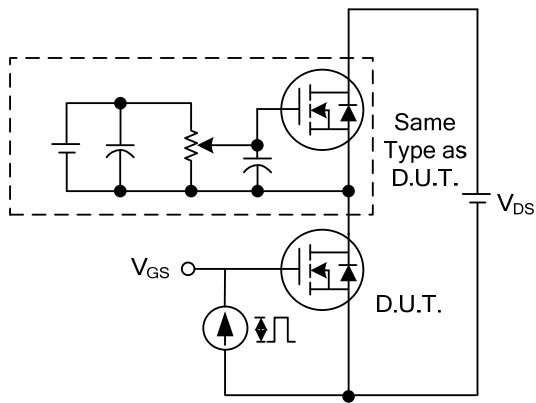
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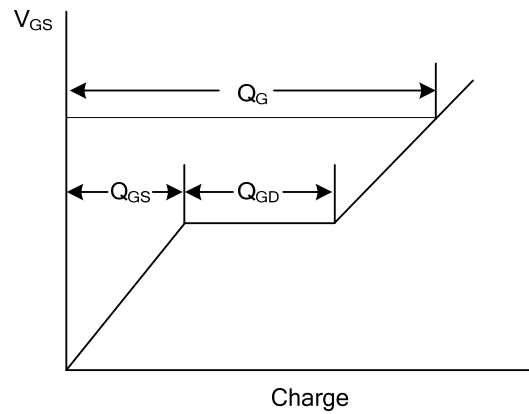
Switching Test Circuit



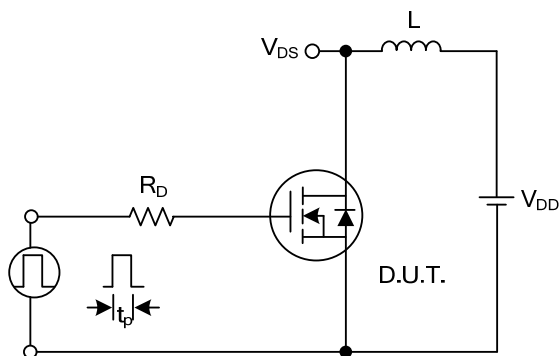
Switching Waveforms



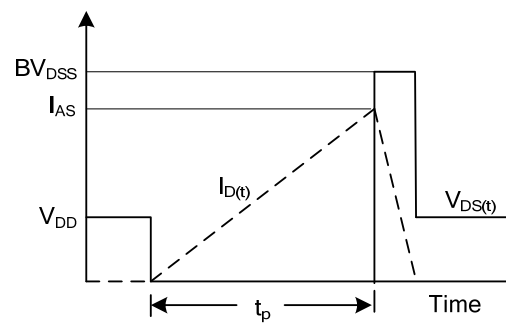
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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