

**UT6P03VZ**

Preliminary

Power MOSFET

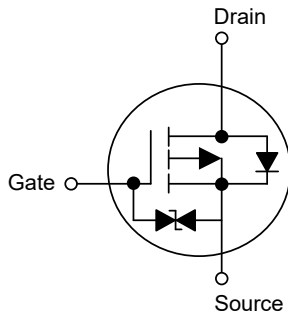
**-6.0A, -30V P-CHANNEL
LOGIC LEVEL
ENHANCEMENT MODE****DESCRIPTION**

The **UT6P03VZ** employs advanced MOSFET technology and features low gate charge while maintaining low on-resistance.

Optimized for switching applications, this device improves the overall efficiency of DC/DC converters and allows operation to higher switching frequencies.

FEATURES

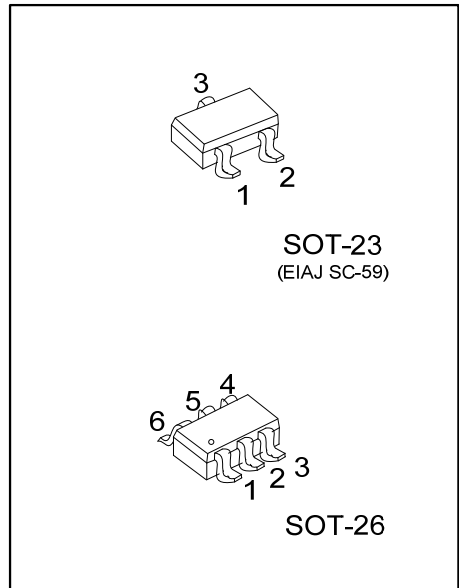
- * $R_{DS(ON)} \leq 50 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -5.0\text{A}$
- $R_{DS(ON)} \leq 65 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -4.0\text{A}$
- $R_{DS(ON)} \leq 94 \text{ m}\Omega$ @ $V_{GS} = -2.5\text{V}$, $I_D = -2.5\text{A}$
- $R_{DS(ON)} \leq 160 \text{ m}\Omega$ @ $V_{GS} = -1.8\text{V}$, $I_D = -0.5\text{A}$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * With ESD protection

SYMBOL**ORDERING INFORMATION**

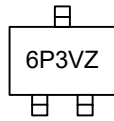
Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UT6P03VZL-AE3-R	UT6P03VZG-AE3-R	SOT-23	G	S	D	-	-	-	Tape Reel
UT6P03VZL-AG6-R	UT6P03VZG-AG6-R	SOT-26	D	D	G	S	D	D	Tape Reel

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

UT6P03VZG-AE3-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) AE3: SOT-23, AG6: SOT-26
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free



■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	± 12	V
Continuous Drain Current	Continuous	I_D	-6	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-12	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	17.5	mJ
Power Dissipation		P_D	1.25	W
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.4	V/ns
Junction Temperature		T_J	+150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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. $L = 0.1\text{mH}$, $I_{AS} = -18.7\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$ Starting $T_J = 25^{\circ}\text{C}$

4. $I_{SD} \leq -6.0\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ **THERMAL DATA**

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	100	$^{\circ}\text{C}/\text{W}$

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

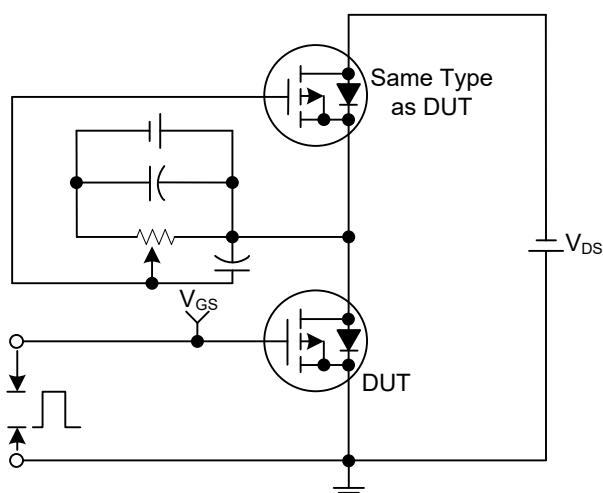
■ **ELECTRICAL CHARACTERISTICS** ($T_c=25^\circ\text{C}$ unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0 V, I _D =-250μA	-30			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-30V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =+12V			10	μA
	Reverse		V _{DS} =0V, V _{GS} =-12V			-10	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250μA	-0.5		-1.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-5.0A			50	mΩ
			V _{GS} =-4.5V, I _D =-4.0A			65	mΩ
			V _{GS} =-2.5V, I _D =-2.5A			94	mΩ
			V _{GS} =-1.8V, I _D =-0.5A			160	mΩ
			DYNAMIC PARAMETERS				
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-15V, f=1.0MHz		860		nF
Output Capacitance		C _{OSS}			113		nF
Reverse Transfer Capacitance		C _{RSS}			90		nF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-24V, V _{GS} =-10V, I _D =-6.0A (Note 1, 2)		22		nC
Gate to Source Charge		Q _{GS}			2		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-6.0A, R _G =3Ω (Note 1, 2)		5		ns
Rise Time		t _R			18		ns
Turn-OFF Delay Time		t _{D(OFF)}			25		ns
Fall-Time		t _F			22		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS2							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-6.0	A
Diode Forward Voltage		V _{SD}	I _S =-6.0A, V _{GS} =0V			-1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =-6.0A, V _{GS} =0V, dI _F /dt=100A/μs		124		nS
Body Diode Reverse Recovery Charge		Q _{rr}			191		nC

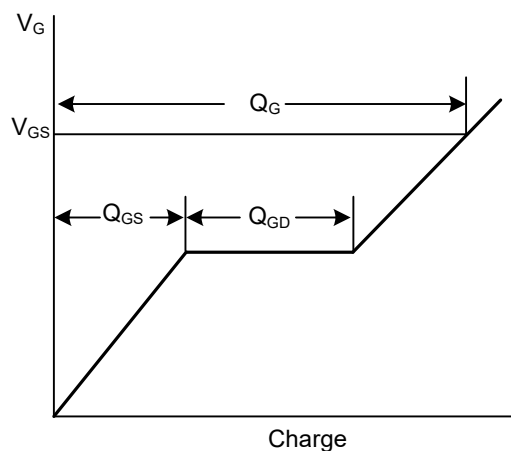
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

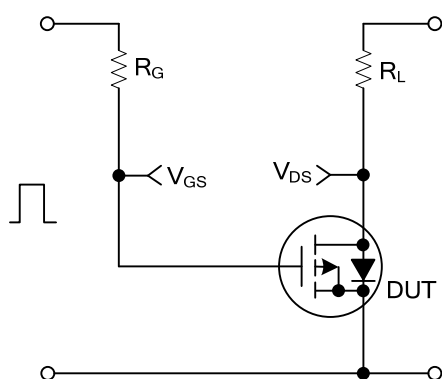
■ TEST CIRCUITS AND WAVEFORMS



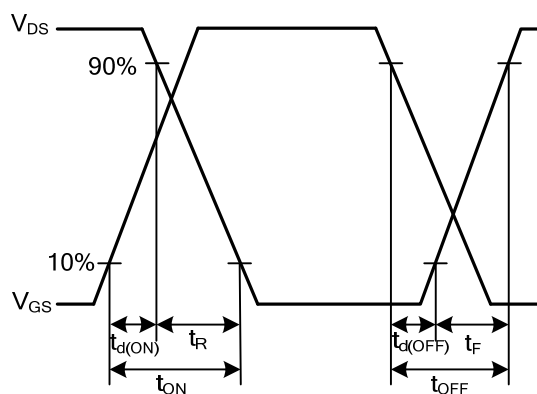
Gate Charge Test Circuit



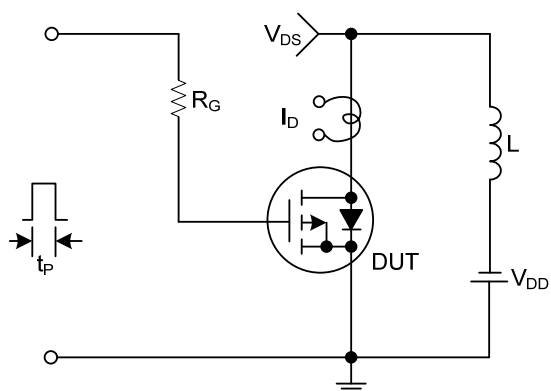
Gate Charge Waveforms



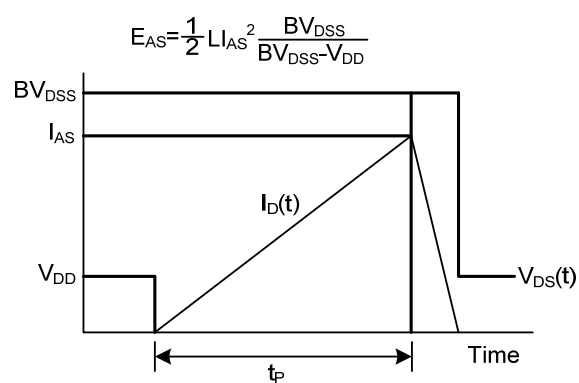
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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