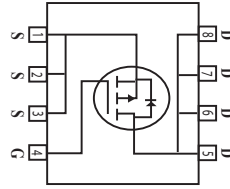


## Surface Mount P-Channel Enhancement Mode MOSFET

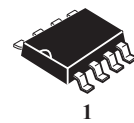
**(Pb)** Lead(Pb)-Free

### Features:

- \* Super high dense
- \* Cell design for low  $R_{DS(ON)}$
- \*  $R_{DS(ON)} < 130m\Omega @ V_{GS} = -4.5V$
- \*  $R_{DS(ON)} < 180m\Omega @ V_{GS} = -2.5V$
- \* Simple Drive Requirement
- \* Lower On-resistance
- \* Fast Switching



**DRAIN CURRENT**  
**-3.5 AMPERES**  
**DRAIN SOURCE VOLTAGE**  
**-20 VOLTAGE**



**SOP-8**

### Description:

The WTK9431 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

### Maximum Ratings (T<sub>A</sub>=25°C Unless Otherwise Specified)

Rating	Symbol	Value	Unite
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±8	V
Continuous Drain Current <sup>(3)</sup> (T <sub>A</sub> = 25°C) (T <sub>A</sub> = 70°C)	I <sub>D</sub>	-3.5 -2.8	A
Pulsed Drain Current <sup>(1,2)</sup>	I <sub>DM</sub>	-18	A
Power Dissipation	P <sub>D</sub>	2.5	W
Maximax Junction-to-Ambient	R <sub>θJA</sub>	50	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	+150	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

### Device Marking

WTK9431=9431SC

**WTK9431****WEITRON****Electrical Characteristics**( $T_A=25^\circ\text{C}$  Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Static</b>					
Drain-Source Breakdown Voltage $V_{GS}=0V, I_D=-250\ \mu\text{A}$	$V_{(BR)DSS}$	-20	-	-	V
Gate-Source Threshold Voltage $V_{DS}=V_{GS}, I_D=-250\ \mu\text{A}$	$V_{GS(th)}$	-0.4	-	-1.0	V
Gate-Source Leakage Current $V_{DS}=0V, V_{GS}=\pm 8V$	$I_{GSS}$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current $V_{DS}=-16V, V_{GS}=0V$ $V_{DS}=-12V, V_{GS}=0V$	$I_{DSS}$	-	-	-1 -25	$\mu\text{A}$
Drain-Source On-Resistance <sup>(2)</sup> $V_{GS}=-10V, I_D=-5.3A$ $V_{GS}=-4.5V, I_D=-4.2A$	$R_{DS(on)}$	-	-	130 180	m $\Omega$
Forward Transconductance <sup>(2)</sup> $V_{DS}=-5V, I_D=-3.5A$	$g_{fs}$	-	6.5	-	S

**Dynamic**

Input Capacitance $V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	$C_{iss}$	-	405	-	pF
Output Capacitance $V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	$C_{oss}$	-	170	-	
Reverse Transfer Capacitance $V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	$C_{rss}$	-	45	-	

**Switching**

Turn-On Delay Time <sup>(2)</sup> $V_{DD}=-5V, I_D=-1A, V_{GS}=-4.5V, R_G=6\Omega$	$t_{d(on)}$	-	6.5	-	nS
Rise Time $V_{DD}=-5V, I_D=-1A, V_{GS}=-4.5V, R_G=6\Omega$	$t_r$	-	20	-	nS
Turn-Off Time $V_{DD}=-5V, I_D=-1A, V_{GS}=-4.5V, R_G=6\Omega$	$t_{d(off)}$	-	31	-	nS
Fall Time $V_{DD}=-5V, I_D=-1A, V_{GS}=-4.5V, R_G=6\Omega$	$t_f$	-	21	-	nS
Total Gate Charge <sup>(2)</sup> $V_{DS}=-5V, I_D=-5.3A, V_{GS}=-4.5V$	$Q_g$	-	6	8.5	nC
Gate-Source Charge $V_{DS}=-5V, I_D=-5.3A, V_{GS}=-4.5V$	$Q_{gs}$	-	0.8	-	nC
Gate-Drain Charge $V_{DS}=-5V, I_D=-5.3A, V_{GS}=-4.5V$	$Q_{gd}$	-	1.3	-	nC
Drain-Source Diode Forward Voltage <sup>(2)</sup> $V_{GS}=0V, I_S=-2.1A$	$V_{SD}$	-	-	-1.2	V
Continuous Source Current (Body Diode) $V_D=V_G=0V, V_S=-1.2V$	$I_S$	-	-	-2.1	A

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width 300 $\mu\text{s}$ , duty cycle  $\leq 2\%$ .3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 125 $^\circ\text{C}/\text{W}$  when mounted on Min. copper pad.

## Characteristics Curve

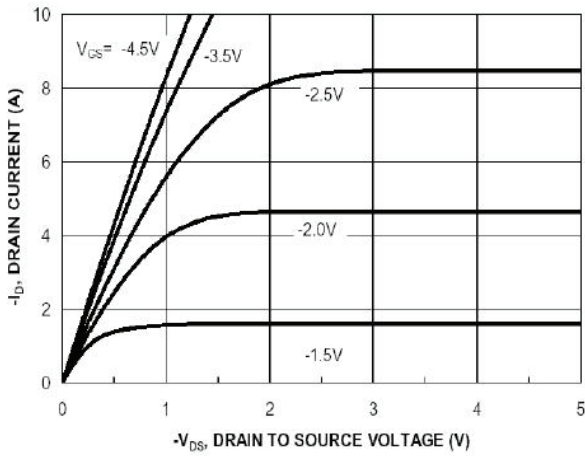


Fig 1. Typical Output Characteristics

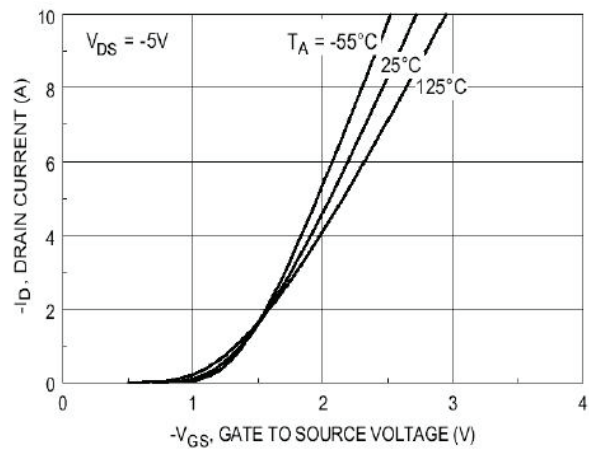


Fig 2. Transfer Characteristics

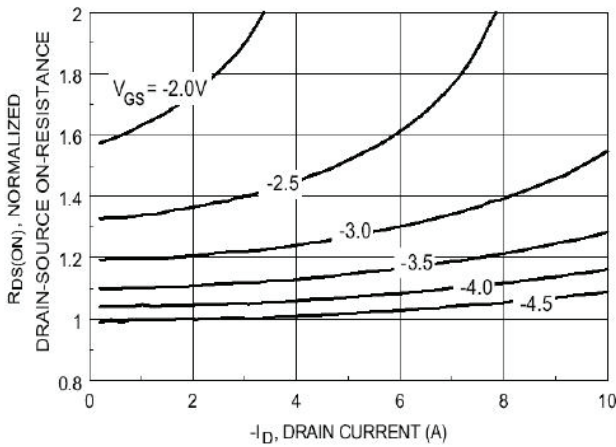


Fig 3. On-Resistance v.s. Drain Current and Gate Voltage

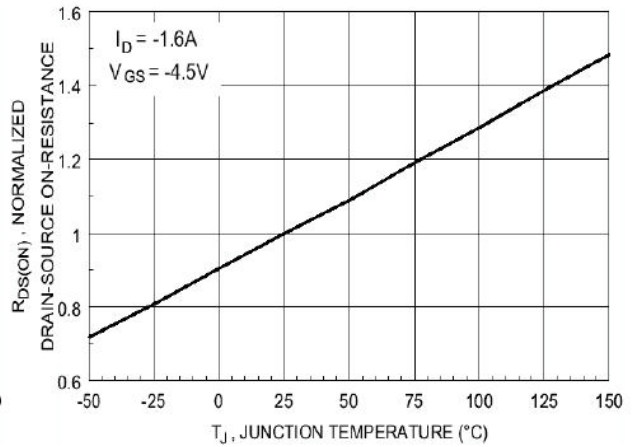


Fig 4. On-Resistance v.s. Junction Temperature

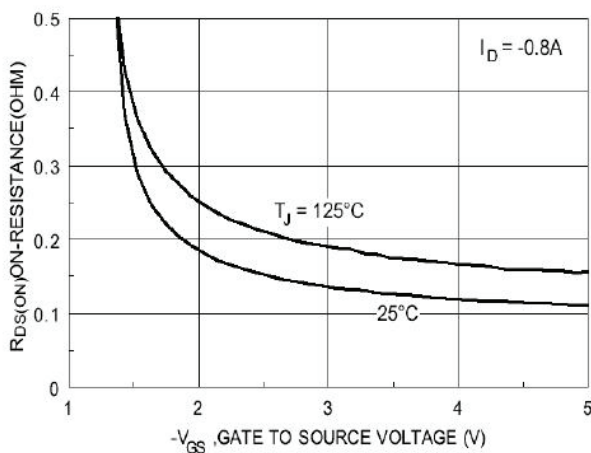


Fig 5. On-Resistance v.s. Gate-Source Voltage

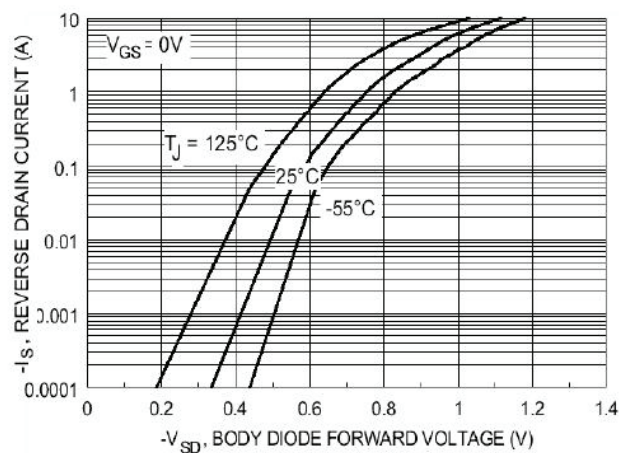
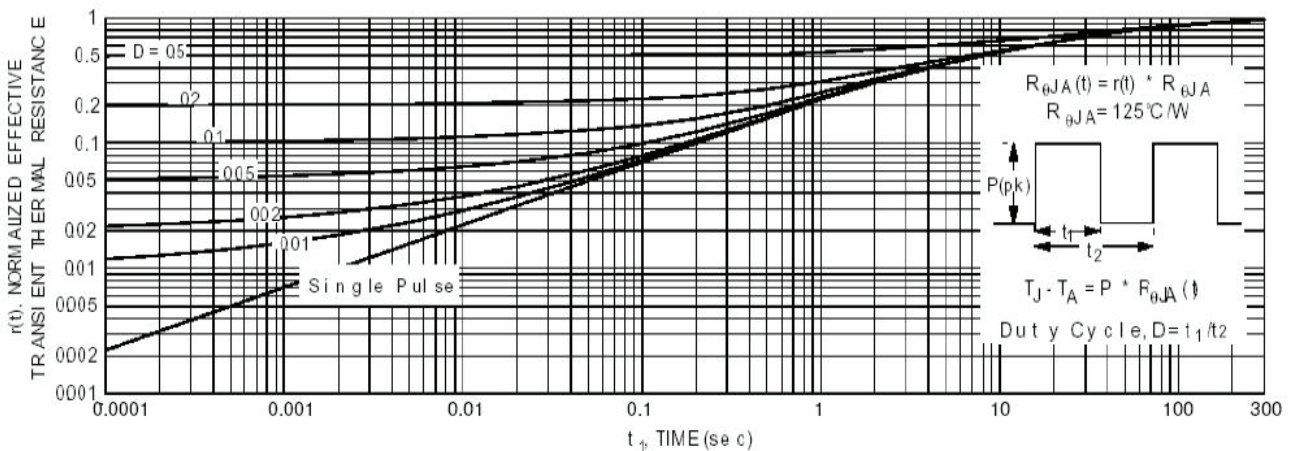
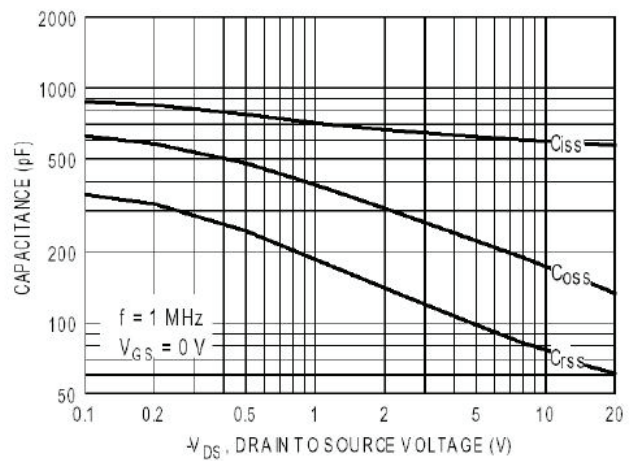
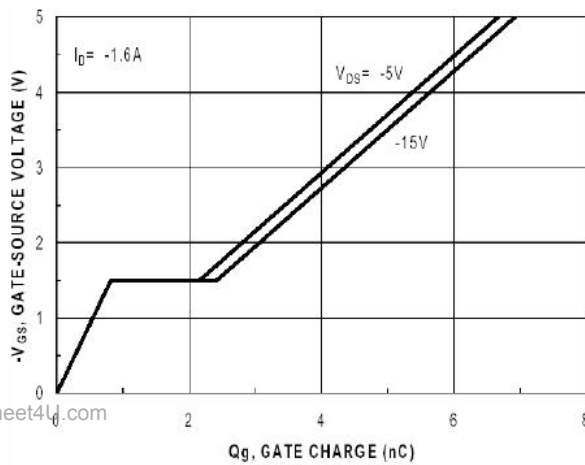
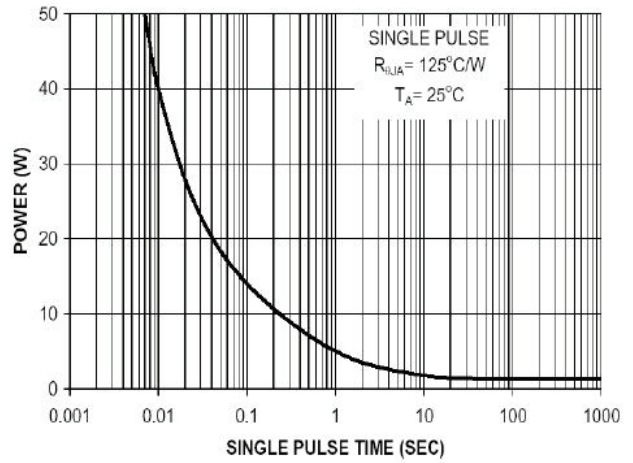
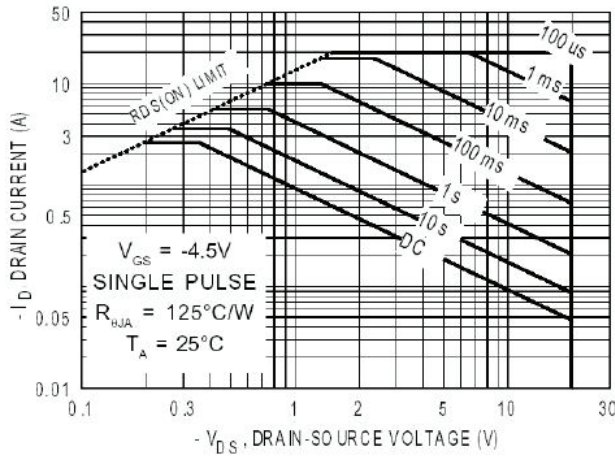


Fig 6. Body Diode Characteristics

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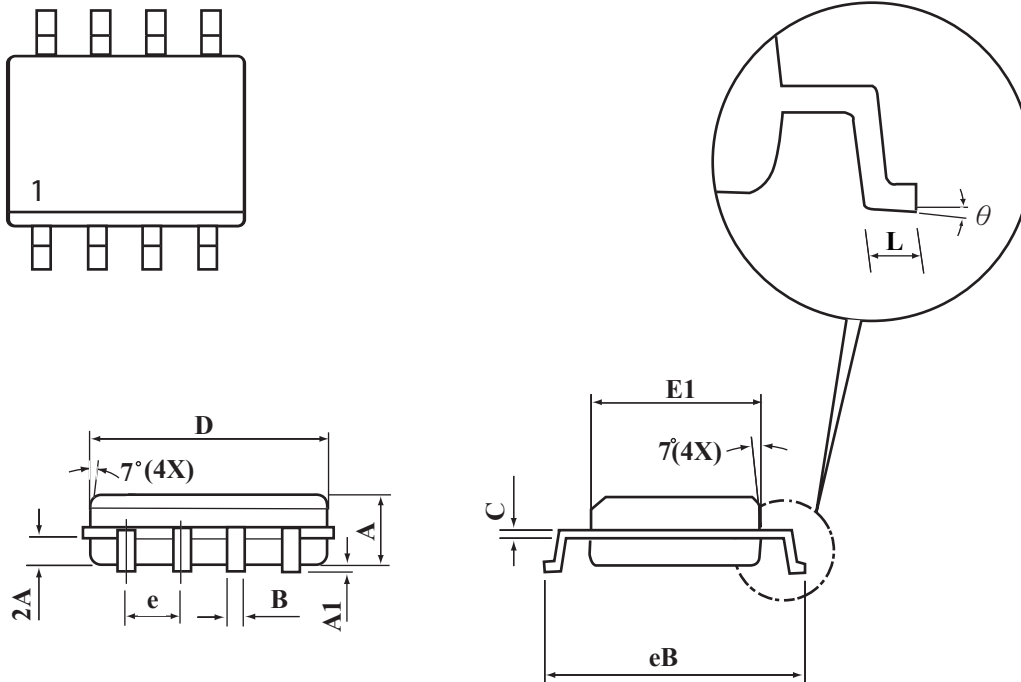
# WTK9431



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**WTK9431****WEITRON****SOP-8 Package Outline Dimensions**

Unit:mm



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SYMBOLS	MILLIMETERS	
	MIN	MAX
<b>A</b>	1.35	1.75
<b>A1</b>	0.10	0.20
<b>B</b>	0.35	0.45
<b>C</b>	0.18	0.23
<b>D</b>	4.69	4.98
<b>E1</b>	3.56	4.06
<b>Be</b>	5.70	6.30
<b>e</b>	1.27 BSC	
<b>L</b>	0.60	0.80
<b>θ</b>	0°	8°