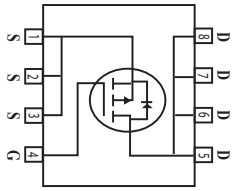
WEITRON

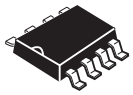
WTK9431

Surface Mount P-Channel Enhancement Mode MOSFET

Lead(Pb)-Free



DRAIN CURRENT
-3.5 AMPERES
DRAIN SOURCE VOLTAGE
-20 VOLTAGE



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SOP-8

Features:

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

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_A=25˚C Unless Otherwise Specified)

Rating	Symbol	Value	Unite
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Drain Current[3] (T_A =25°C) (T_A =70°C)	I_D	-3.5 -2.8	A
Pulsed Drain Current[1,2]	I_{DM}	-18	A
Power Dissipation	P_D	2.5	W
Maximax Junction-to-Ambient	$R\theta_{JA}$	50	°C/W
Operating Junction Temperature Range	T_J	+150	°C
Storage Temperature Range	Tstg	-55 to +150	°C

Device Marking

WTK9431=9431SC

Electrical Characteristics (T_A=25°C Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Static					
Drain-Source Breakdown Voltage V_{GS}=0V, I_D=-250 μA	$V_{(BR)DSS}$	-20	-	-	V
Gate-Source Threshold Voltage V_{DS}=V_{GS}, I_D=-250 μA	$V_{GS\ (th)}$	-0.4	-	-1.0	V
Gate-Source Leakage Current V_{DS}=0V, V_{GS}=±8V	I_{GSS}	-	-	±100	nA
Zero Gate Voltage Drain Current V_{DS}=-16V, V_{GS}=0V V_{DS}=-12V, V_{GS}=0V	I_{DSS}	-	-	-1 -25	μA
Drain-Source On-Resistance(2) V_{GS}=-10V, I_D=-5.3A V_{GS}=-4.5V, I_D=-4.2A	$R_{DS(on)}$	- -	- -	130 180	mΩ
Forward Transconductance(2) V_{DS}=-5V, I_D=-3.5A	g_{fs}	-	6.5	-	S
Dynamic					
Input Capacitance V_{DS}=-10V, V_{GS}=0V, f=1MHZ	C_{iss}	-	405	-	PF
Output Capacitance V_{DS}=-10V, V_{GS}=0V, f=1MHZ	C_{oss}	-	170	-	
Reverse Transfer Capacitance V_{DS}=-10V, V_{GS}=0V, f=1MHZ	C_{rss}	-	45	-	
Switching					
Turn-On Delay Time(2) V_{DD} = -5V, I_D = -1A, V_{GS} = -4.5V, R_G = 6Ω	$t_{d(on)}$	-	6.5	-	nS
Rise Time V_{DD} = -5V, I_D = -1A, V_{GS} = -4.5V, R_G = 6Ω	t_r	-	20	-	nS
Turn-Off Time V_{DD} = -5V, I_D = -1A, V_{GS} = -4.5V, R_G = 6Ω	$t_{d(off)}$	-	31	-	nS
Fall Time V_{DD} = -5V, I_D = -1A, V_{GS} = -4.5V, R_G = 6Ω	t_f	-	21	-	nS
Total Gate Charge(2) V_{DS}=-5V, I_D=-5.3A, V_{GS}=-4.5V	Qg	-	6	8.5	nc
Gate-Source Charge V_{DS}=-5V, I_D=-5.3A, V_{GS}=-4.5V	Qgs	-	0.8	-	nc
Gate-Drain Charge V_{DS}=-5V, I_D=-5.3A, V_{GS}=-4.5V	Qgd	-	1.3	-	nc
Drain-Source Diode Forward Voltage(2) 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 300μs, duty cycle ≤ 2%.
3. Surface mounted on 1 in² copper pad of FR4 board; 125°C/W when mounted on Min. copper pad.

Characteristics Curve

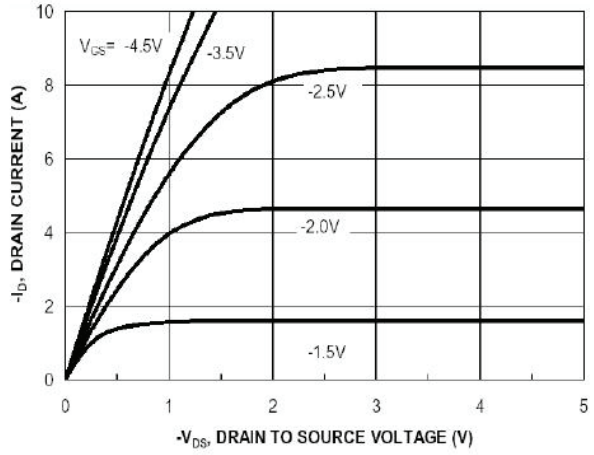


Fig 1. Typical Output Characteristics

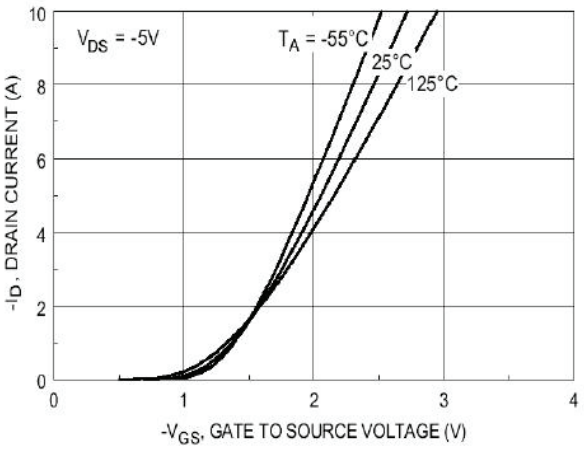


Fig 2. Transfer Characteristics

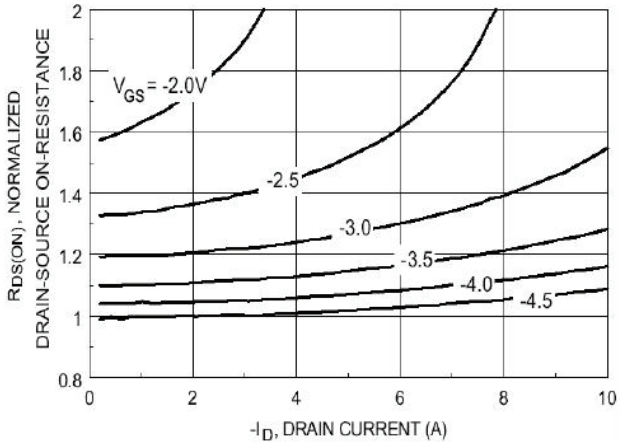


Fig 3. On-Resistance v.s. Drain Current and Gate Voltage

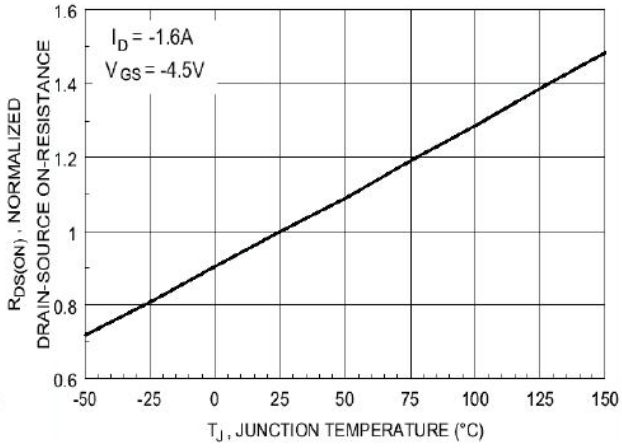


Fig 4. On-Resistance v.s. Junction Temperature

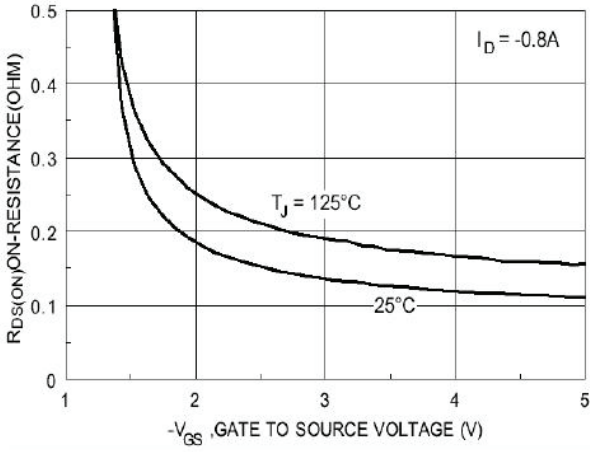


Fig 5. On-Resistance v.s. Gate-Source Voltage

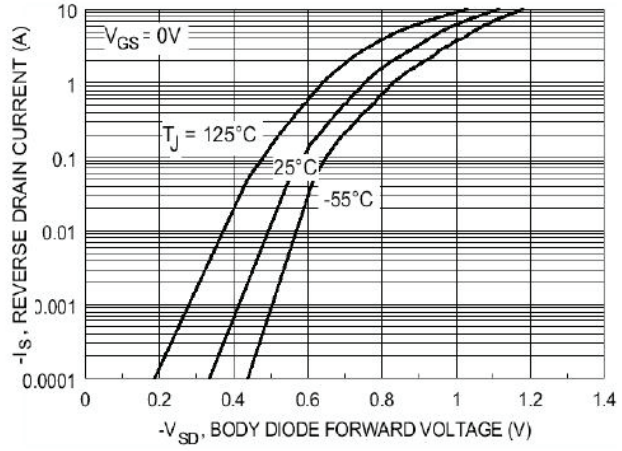


Fig 6. Body Diode Characteristics

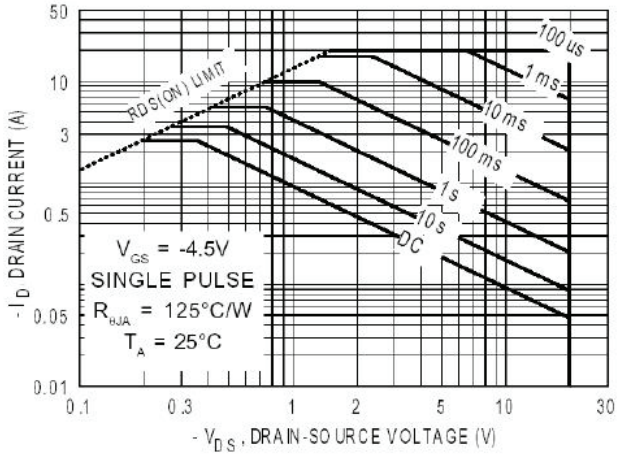


Fig 7. Maximum Safe Operating Area

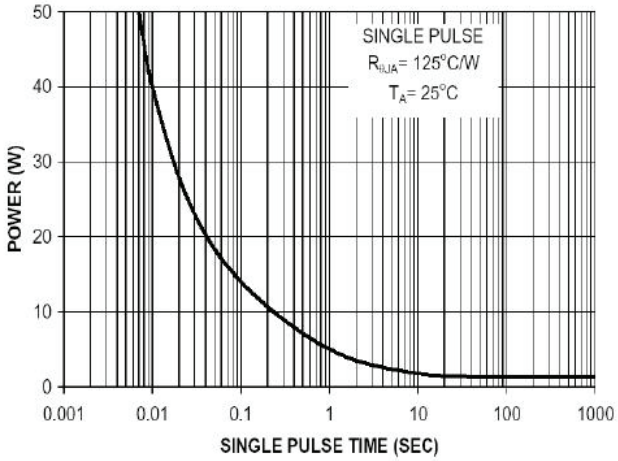


Fig 8. Single Pulse Maximum Power Dissipation

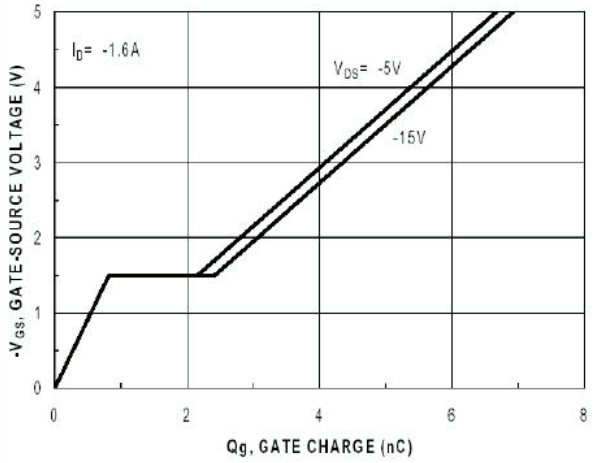


Fig 9. Gate Charge Characteristics

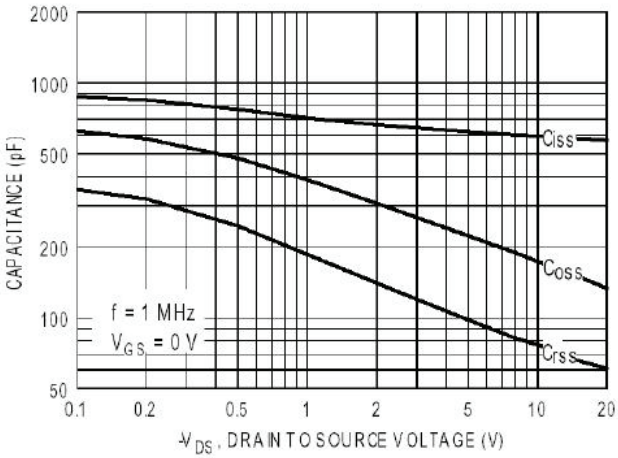


Fig 10. Typical Capacitance Characteristics

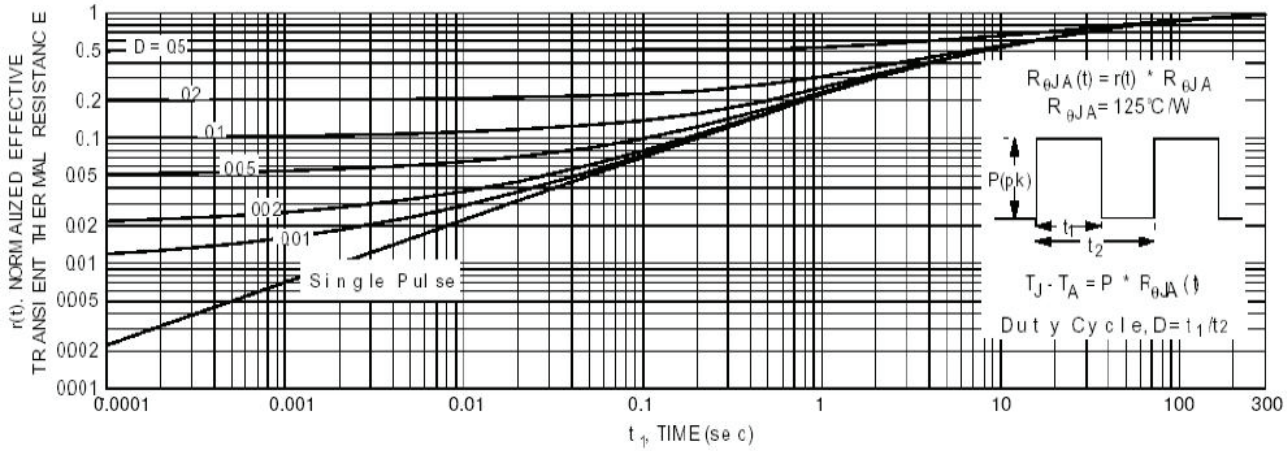
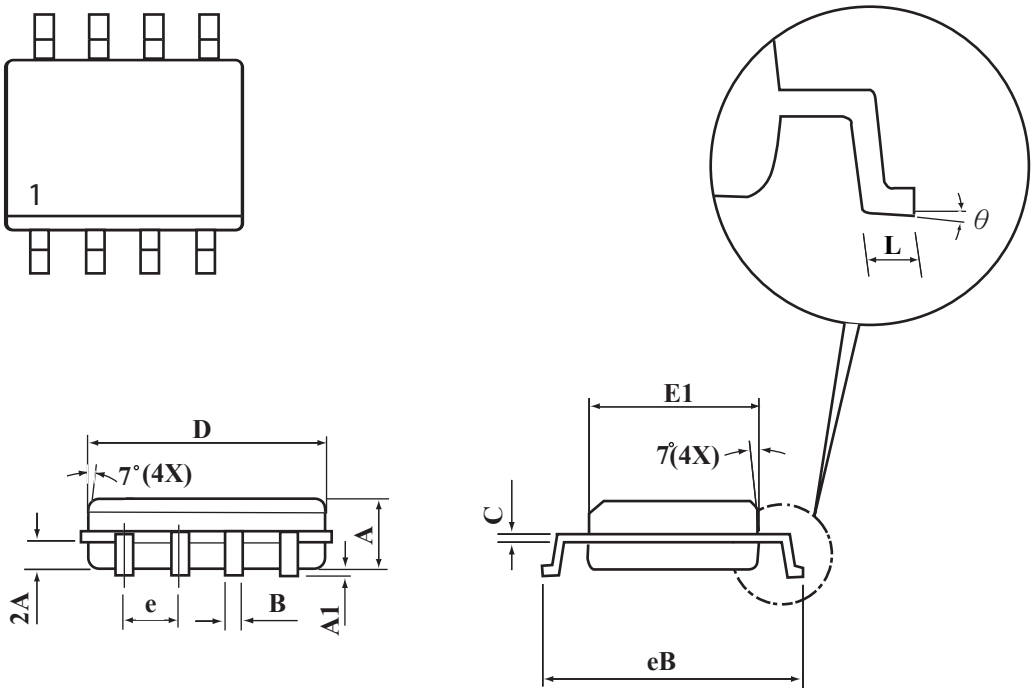


Fig 11. Transient Thermal Response Curve

SOP-8 Package Outline Dimensions

Unit:mm



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