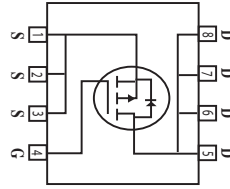


## Surface Mount P-Channel Enhancement Mode MOSFET

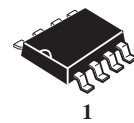
 **Lead(Pb)-Free**

### Features:

- \* Super high dense
- \* Cell design for low  $R_{DS(ON)}$
- \*  $R_{DS(ON)} < 20m\Omega @ V_{GS} = -10V$
- \*  $R_{DS(ON)} < 35m\Omega @ V_{GS} = -4.5V$
- \* Simple Drive Requirement
- \* Lower On-resistance
- \* Fast Switching



**DRAIN CURRENT**  
**-8 AMPERES**  
**DRAIN SOURCE VOLTAGE**  
**-30 VOLTAGE**



1

**SOP-8**

### Description:

The WTK4435 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 ( $T_A = 25^\circ C$ Unless Otherwise Specified)

Rating	Symbol	Value	Unite
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_A = 25^\circ C$ ) ( $T_A = 70^\circ C$ )	$I_D$	-8 -6	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	-50	A
Power Dissipation ( $T_A = 25^\circ C$ )	$P_D$	2.5	W
Maximax Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ C/W$
Operating Junction Temperature Range	$T_J$	+150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ C$

### Device Marking

WTK4435=4435SC

## Electrical Characteristics (T<sub>A</sub>=25°C Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Static</b>					
Drain-Source Breakdown Voltage V <sub>GS</sub> =0V, I <sub>D</sub> =-250 uA	V <sub>(BR)DSS</sub>	-30	-	-	V
Gate-Source Threshold Voltage V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250 uA	V <sub>GS(th)</sub>	-1.0	-	-3.0	V
Gate-Source Leakage Current V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	I <sub>GSS</sub>	-	-	±100	nA
Zero Gate Voltage Drain Current V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V	I <sub>DSS</sub>	-	-	-1 -5	μA
Drain-Source On-Resistance V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A	R <sub>DS(on)</sub>	- -	- -	20 35	mΩ
Forward Transconductance V <sub>DS</sub> =-10V, I <sub>D</sub> =-8A	g <sub>fs</sub>	-	20	-	S

## Dynamic

Input Capacitance V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHZ	C <sub>iss</sub>	-	2800	-	pF
Output Capacitance V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHZ	C <sub>oss</sub>	-	1400	-	
Reverse Transfer Capacitance V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHZ	C <sub>rss</sub>	-	350	-	

## Switching

Turn-On Delay Time <sup>(2)</sup> V <sub>DS</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω, R <sub>D</sub> = 15Ω	t <sub>d(on)</sub>	-	30	-	nS
Rise Time V <sub>DS</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω, R <sub>D</sub> = 15Ω	t <sub>r</sub>	-	20	-	nS
Turn-Off Time V <sub>DS</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω, R <sub>D</sub> = 15Ω	t <sub>d(off)</sub>	-	120	-	nS
Fall Time V <sub>DS</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω, R <sub>D</sub> = 15Ω	t <sub>f</sub>	-	80	-	nS
Total Gate Charge <sup>(2)</sup> V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.6A, V <sub>GS</sub> =-10V	Q <sub>g</sub>	-	47	-	nc
Gate-Source Charge V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.6A, V <sub>GS</sub> =-10V	Q <sub>gs</sub>	-	9.5	-	nc
Gate-Drain Charge V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.6A, V <sub>GS</sub> =-10V	Q <sub>gd</sub>	-	8	-	nc
Drain-Source Diode Forward Voltage <sup>(2)</sup> V <sub>GS</sub> =0V, I <sub>S</sub> =-2.1A	V <sub>SD</sub>	-	-0.75	-1.2	V
Continuous Source Current(Body Diode) V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =-1.2V	I <sub>S</sub>	-	-	-2.1	A
Pulsed Source Current(Body Diode) <sup>(1)</sup>	I <sub>SM</sub>	-	-	-50	A

Notes: 1. Pulse width limited by Max. junction temperature.  
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

## Characteristics Curve

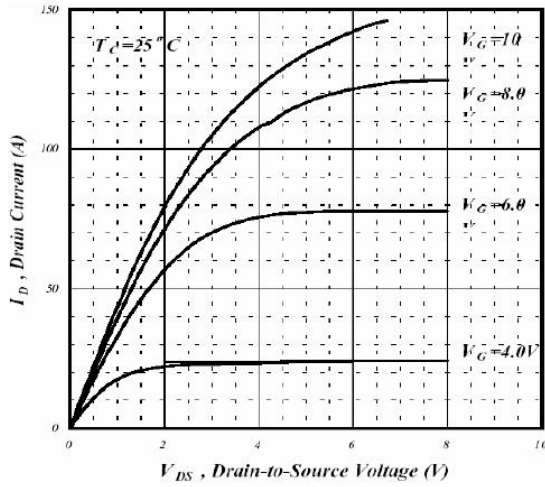


Fig 1. Typical Output Characteristics

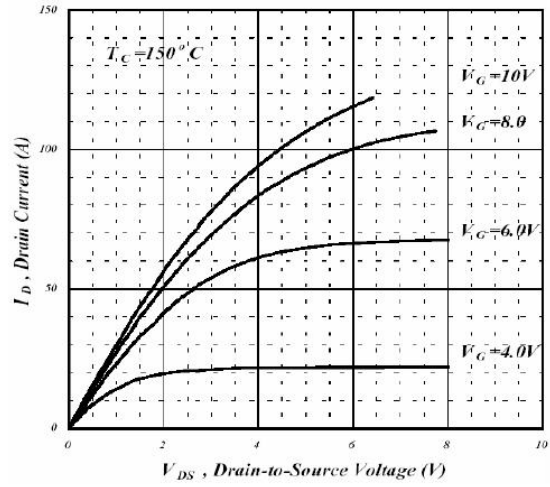


Fig 2. Typical Output Characteristics

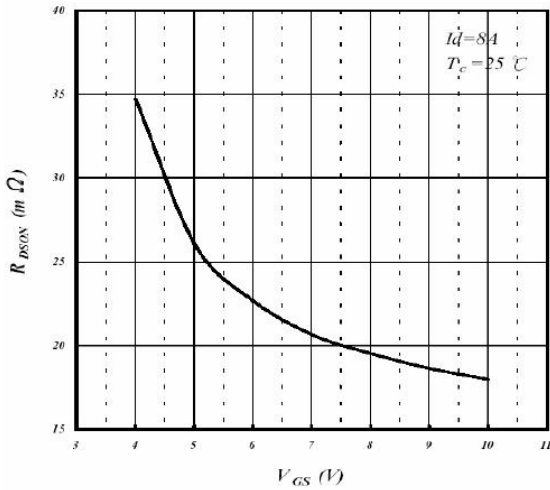


Fig 3. On-Resistance v.s. Gate Voltage

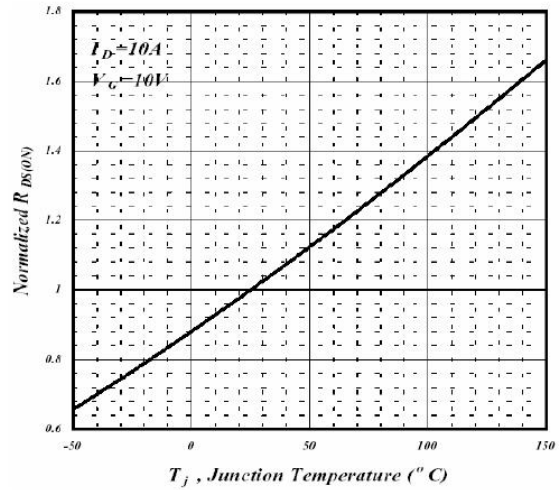


Fig 4. Normalized On-Resistance v.s. Junction Temperature

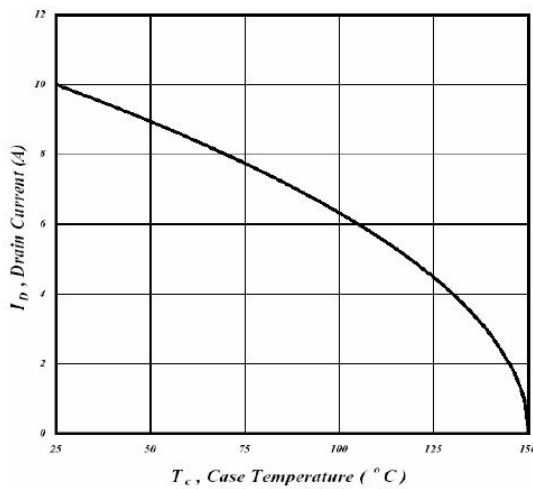


Fig 5. Maximum Drain Current v.s. Case Temperature

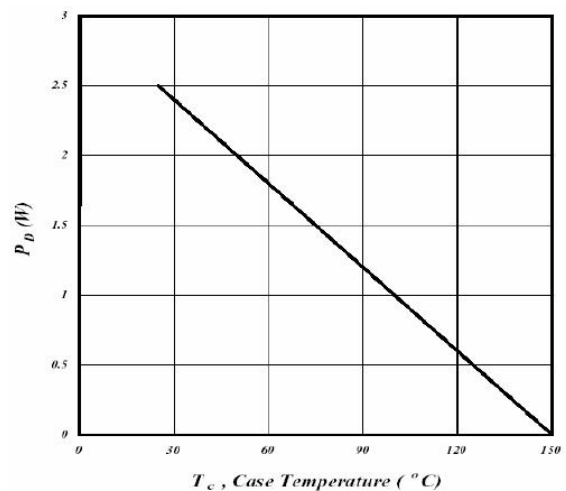


Fig 6. Type Power Dissipation

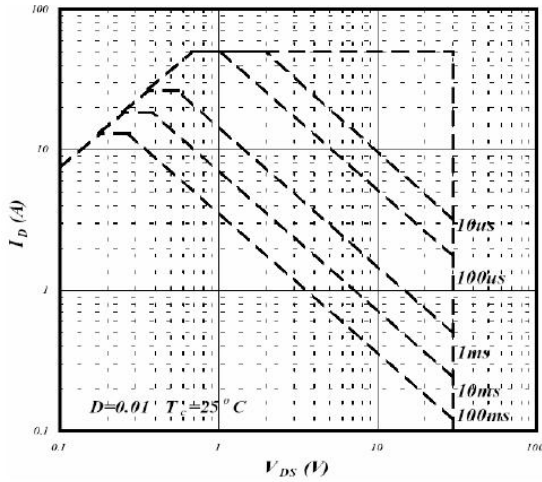


Fig 7. Maximum Safe Operating Area

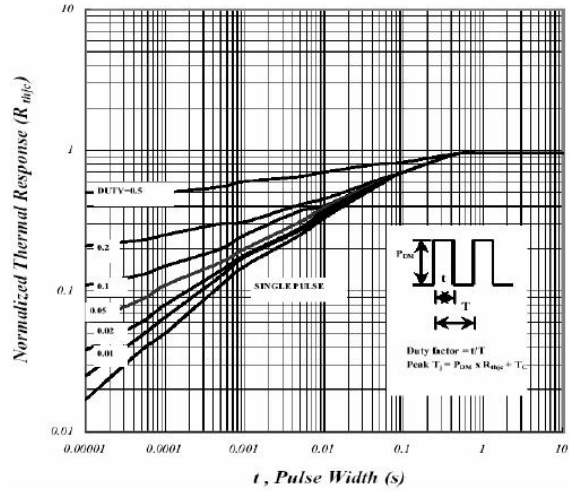


Fig 8. Effective Transient Thermal Impedance

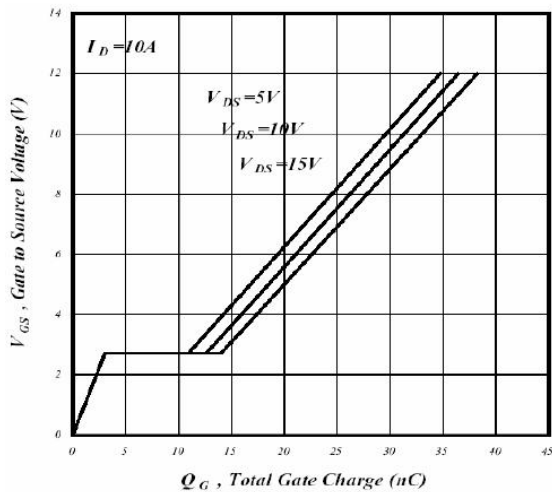


Fig 9. Gate Charge Characteristics

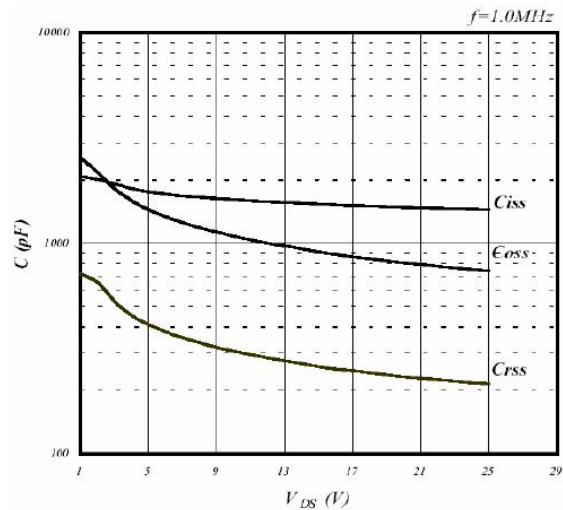


Fig 10. Typical Capacitance Characteristics

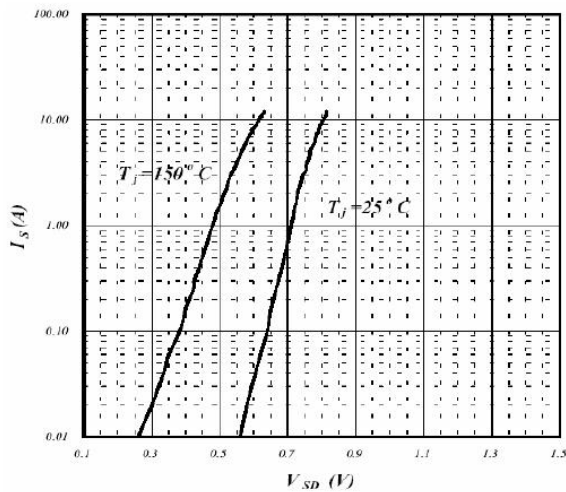


Fig 11. Forward Characteristics of Reverse Diode

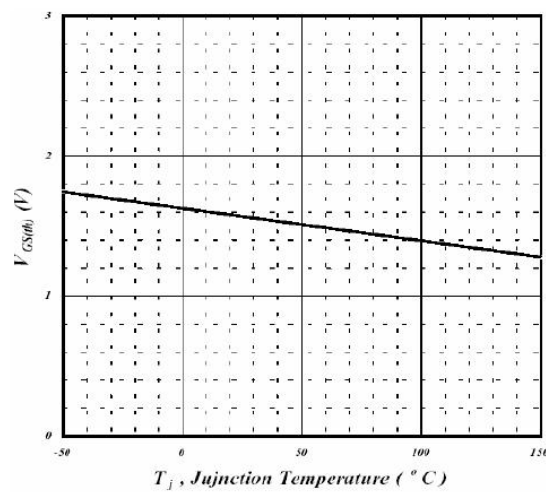
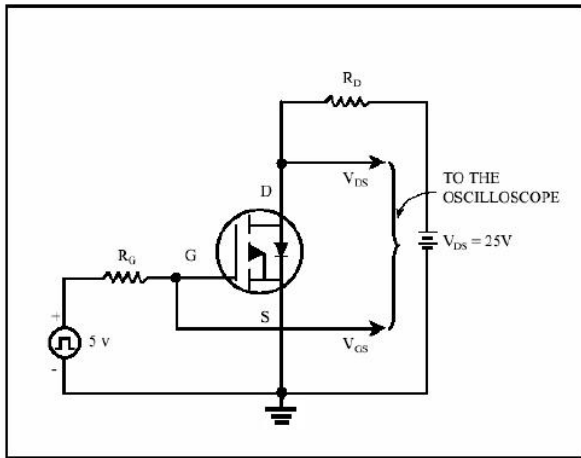
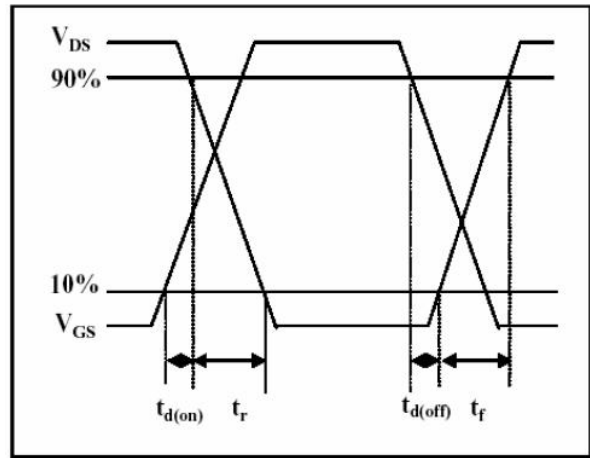


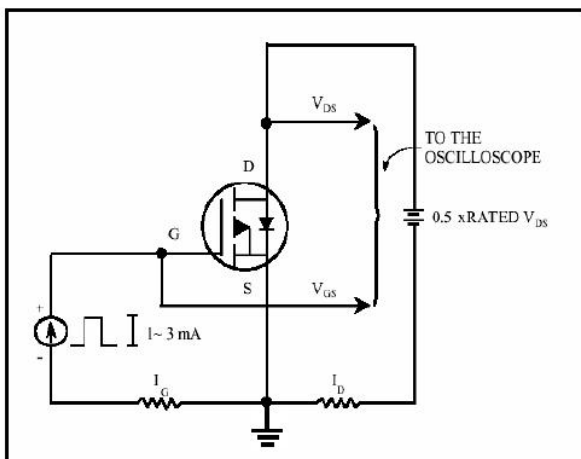
Fig 12. Gate Threshold Voltage v.s. Junction Temperature



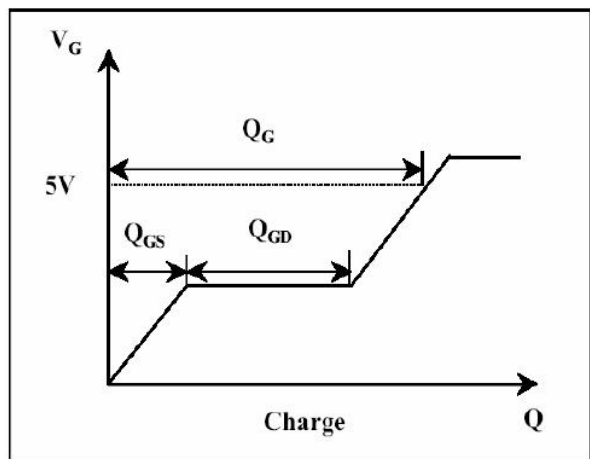
**Fig 13. Switching Time Circuit**



**Fig 14. Switching Time Waveform**



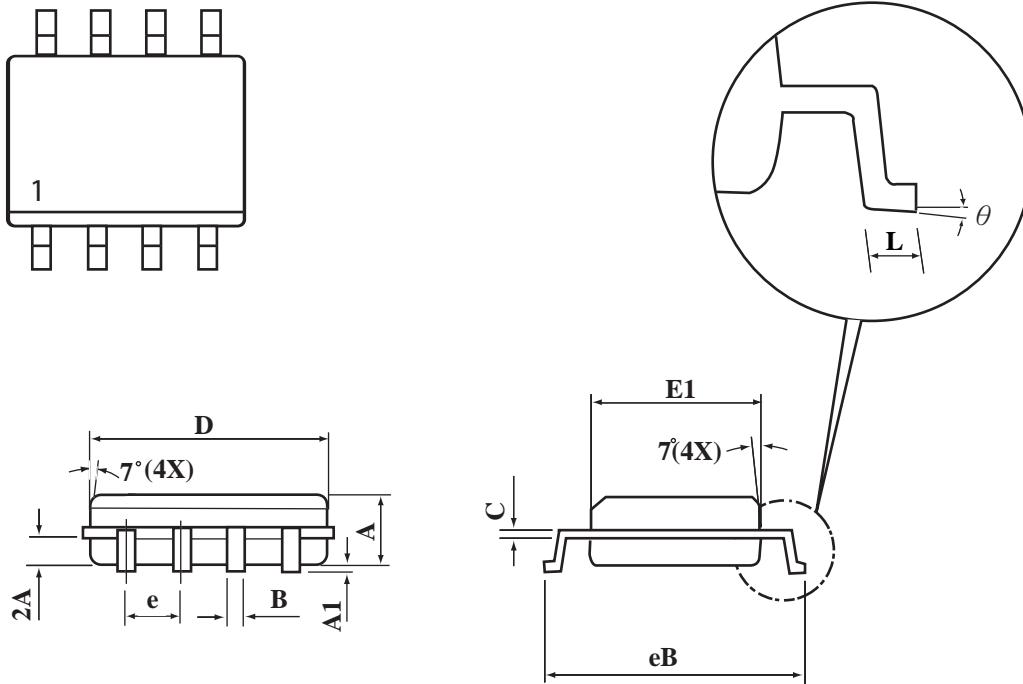
**Fig 15. Gate Charge Circuit**



**Fig 16. Gate Charge Waveform**

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
eB	5.70	6.30
e	1.27 BSC	
L	0.60	0.80
θ	0°	8°