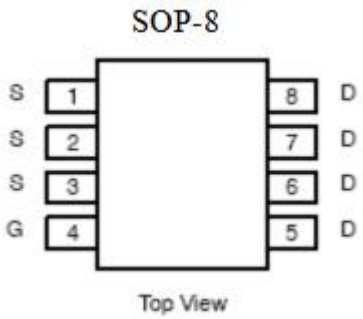
1. Features

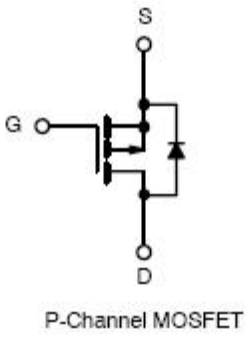
- $R_{DS(on)}$=50mΩ(typ)@ V_{GS}=-10 V
- Super low gate charge
- Green device available
- Excellent Cdv/dt effect decline
- Advanced high cell density trench technology

2.Description

The KIA9435 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The KIA9435 meet the RoHs and Green Product requirement.

3.Symbol





4.Absolute maximum ratings

(T_A=25°C,unless otherwise noted)

Parameter		Symbol	Rating	Units
Drain-source voltage		V_{DSS}	-30	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current V_{GS}@10V[1]	T_A=25ºC	I_D	-5.3	A
Pulsed drain current[2]		I_{DM}	-20	A
Total power dissipation[4]	T_A=25ºC	P_D	2.5	W
Junction and storage temperature range		T_J ,T_{STG}	-55 to150	ºC
Thermal resistance-junction to case[1]		$R_{θJC}$	50	ºC/W

5.Electrical characteristics

(T_J=25°C,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30	-	-	V
BV_{DSS} Temperature coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25 ºC, I_D=-1mA	-	-0.023	-	V/ ºC
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-24V,V_{GS}=0V, T_J=55°C	-	-	5	
Gate-source leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	-1.0	-1.6	-3.0	V
$V_{GS(th)}$Temperature coefficient	$\triangle V_{GS(th)}$		-	4	-	mV/ºC
Static drain-source on- resistance[2]	$R_{DS(on)}$	V_{GS}=-10V,I_D=-4A	-	50	65	mΩ
		V_{GS}=-4.5V,I_D=-4A	-	75	105	
Forward transcend ductance	g_{FS}	V_{DS}=-15V, I_D=-4.5A	-	8	-	S
Total gate charge	Q_g	V_{DS}=-15V, V_{GS}=-20V I_D =-5.3A	-	12	-	nC
Gate-source charge	Q_{gs}		-	2.3	-	
Gate-drain charge	Q_{gd}		-	3.1	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V, R_G=6Ω, V_{GS}=-10V I_D=-1A	-	15	-	ns
Rise time	t_r		-	13.2	-	
Turn-off delay time	$t_{d(off)}$		-	57	-	
Fall time	t_f		-	20	-	
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V F=1.0MHZ	-	525	-	pF
Output capacitance	C_{oss}		-	132	-	
Reverse transfer capacitance	C_{rss}		-	70	-	
Diode characteristics						
Continuous source current[1]	I_S	V_G=V_D=0V,Force current	-	-	-5.3	A
Pulsed source current[2.5]	I_{SM}		-	-	-20	A
Diode forward voltage[2]	V_{SD}	V_{GS}=0V,I_S=-4A, T_J=25°C	-	-	1.5	V

Note:1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2. The data tested by pulsed, pulse width ≤300us,duty cycle ≤2%.

3. The power dissipation is limited by 150 ºC junction temperature.

4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

6. Test circuits and waveforms

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

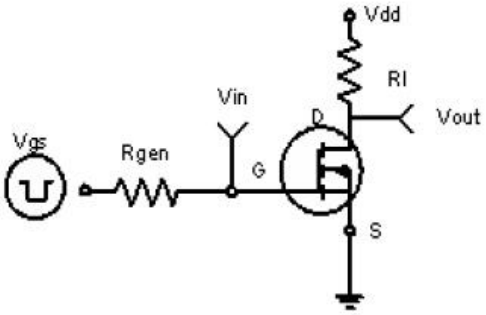


Figure 1:Switching Test Circuit

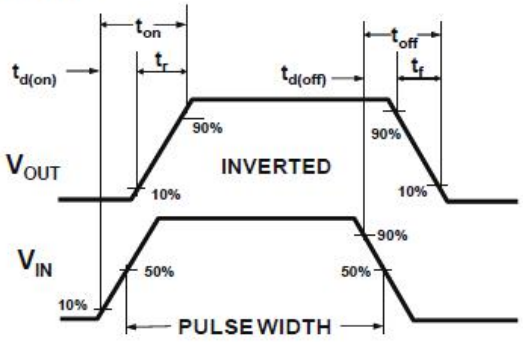


Figure 2:Switching Waveforms

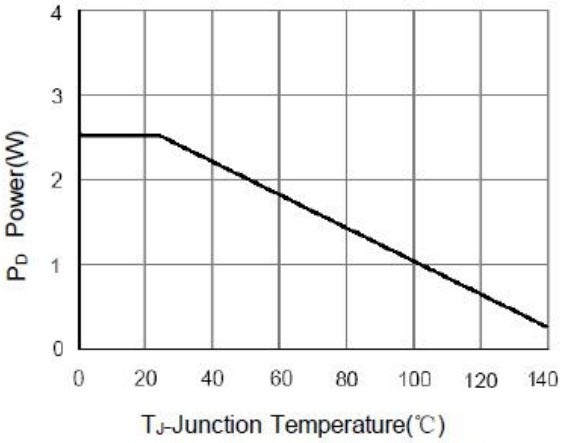


Figure 3 Power Dissipation

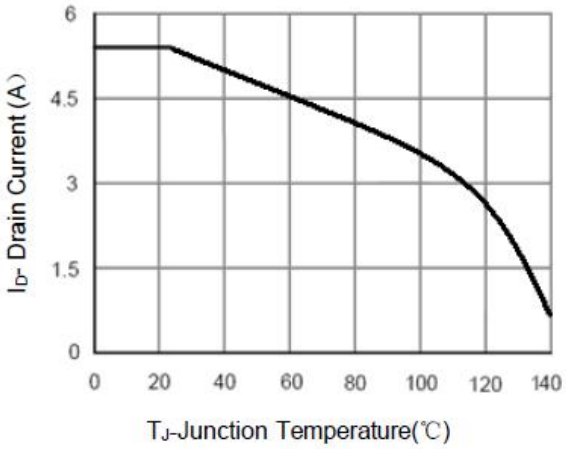


Figure 4 Drain Current

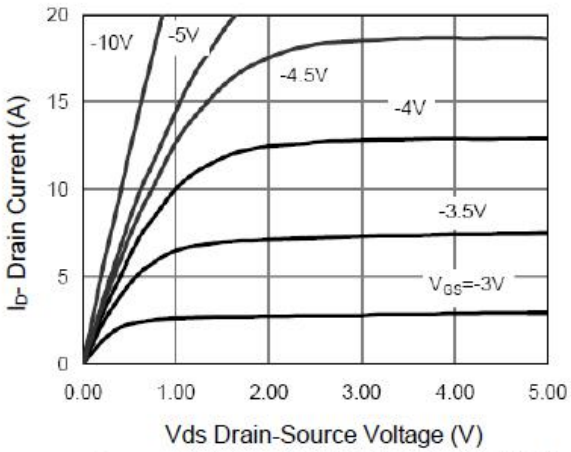


Figure 5 Output CHARACTERISTICS

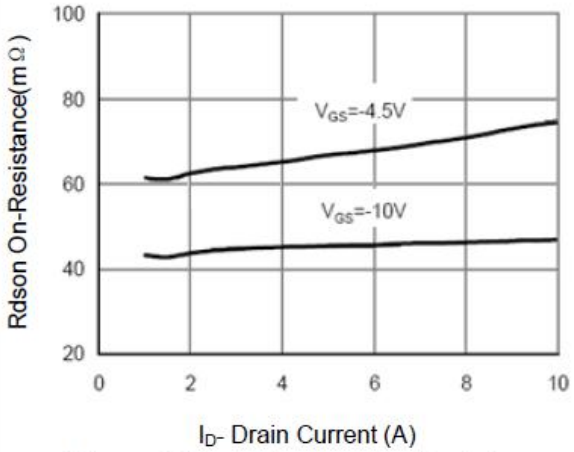


Figure 6 Drain-Source On-Resistance

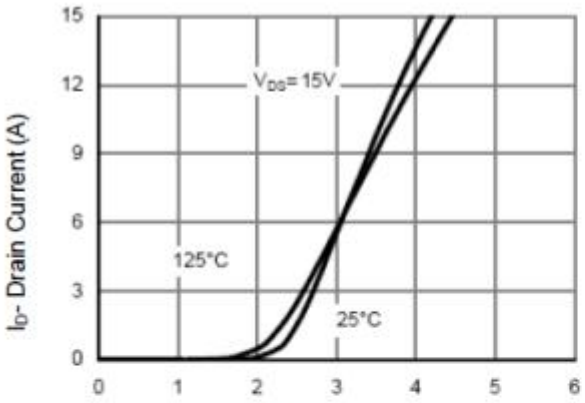


Figure 7 Transfer Characteristics

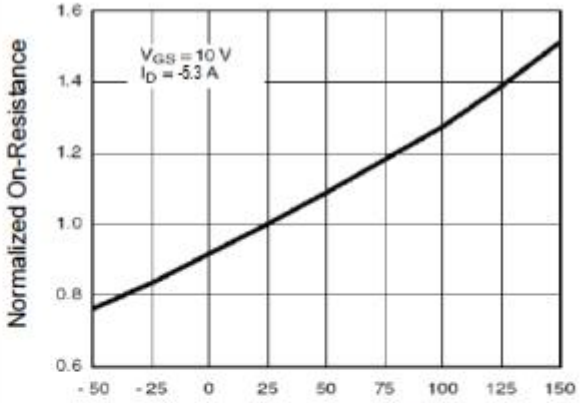


Figure 8 Drain-Source On-Resistance

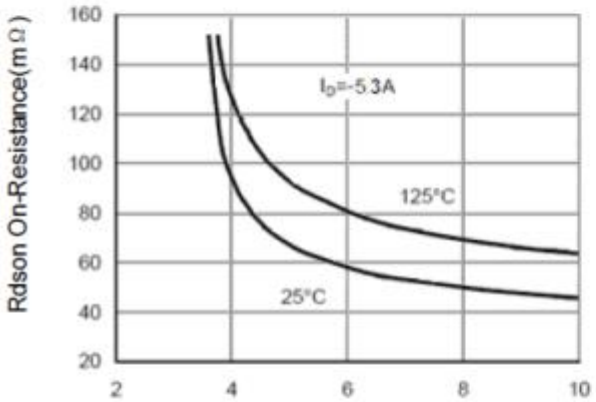


Figure 9 Rdson vs Vgs

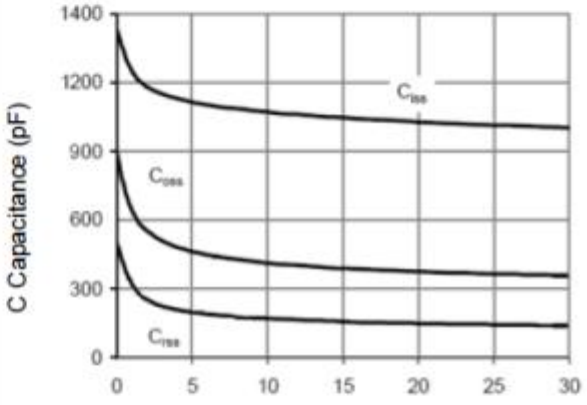


Figure 10 Capacitance vs Vds

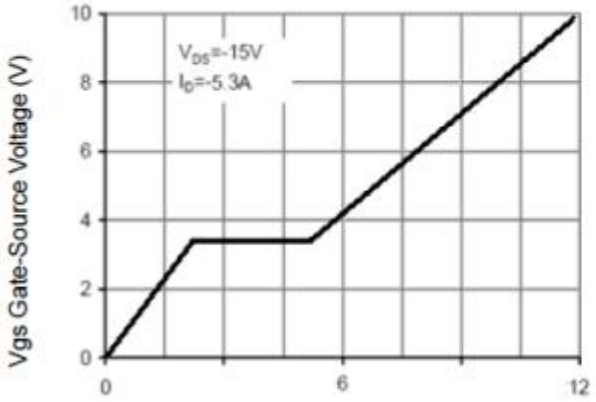


Figure 11 Gate Charge

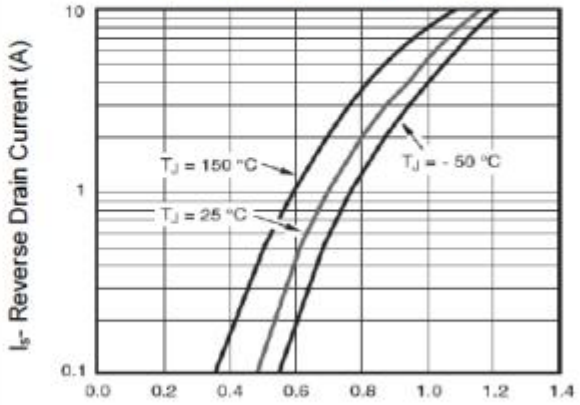


Figure 12 Source- Drain Diode Forward

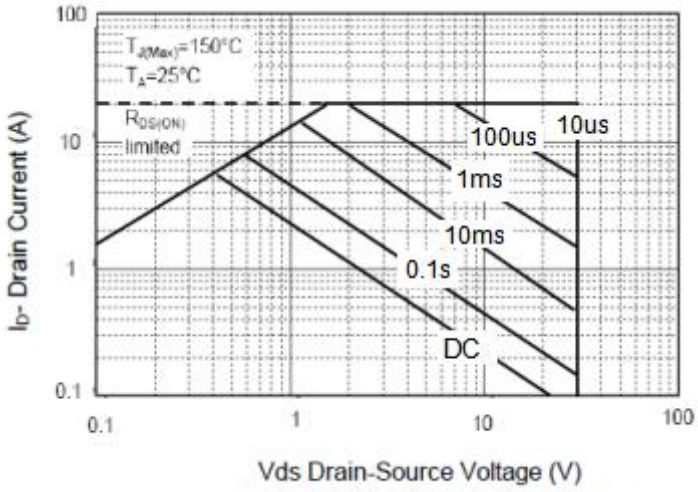


Figure 13 Safe Operation Area

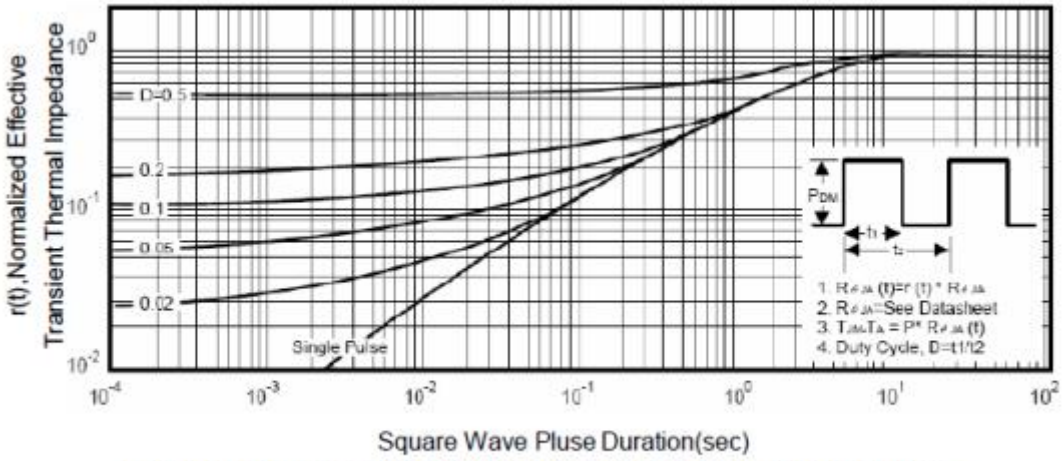


Figure 14 Normalized Maximum Transient Thermal Impedance