►►KY

## ShenZhen HanKingYuan Electronic Co.,Ltd

KY9435

-30V P-Channel Mosfet

FEATURES

- $R_{DS(ON)} \le 55m\Omega$ (43mΩ Typ.) @V_{GS}=-10V

- $R_{DS(ON)} \le 90m\Omega$ (55mΩ Typ.) @V_{GS}=-4.5V

APPLICATIONS

- PWM Applications
- Load Switch
- Power Management
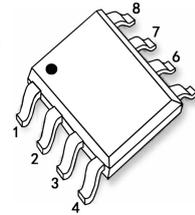
MARKING
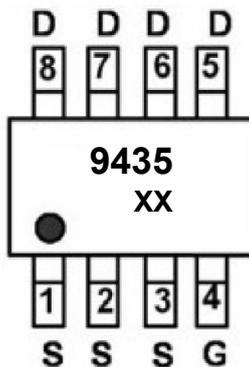
9435：Device Code
XX： DC Code

SOP-8

1: S	3: S	5: D	7: D
2: S	4: G	6: D	8: D

P-CHANNEL MOSFET
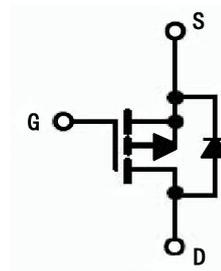
Absolute Maximum Ratings (T$_a$=25℃ unless otherwise specified)

Symbol	Param		Max.	Units
V$_{DSS}$	Drain-Source Voltage		-30	V
V$_{GSS}$	Gate-Source Voltage		±20	V
I$_D$	Continuous Drain Current	T$_a$= 25℃	-5.1	A
		T$_a$= 100℃	-3.2	A
I$_{DM}$	Pulsed Drain Current [note1]		-20	A
P$_D$	Power Dissipation	T$_a$= 25℃	2.5	W
R$_{θJA}$	Thermal Resistance, Junction to Ambient		50	℃/W
T$_J$, T$_{STG}$	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_a=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D= -250µA	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V,	-	-	-1	µA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250µA	-1	-1.35	-2	V
$R_{DS(on)}$ note2	Static Drain-Source on-Resistance	V_{GS} =-10V, I_D =-5.1A	-	43	55	mΩ
		V_{GS} =-4.5V, I_D =-4.2A	-	55	90	
g_{FS}	Forward Transconductance	V_{DS} =-5V, I_D = -5.1A	4	-	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	-	980	-	pF
C_{oss}	Output Capacitance		-	390	-	pF
C_{rss}	Reverse Transfer Capacitance		-	135	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D = -5.1A, V_{GS} = -10V	-	11	-	nC
Q_{gs}	Gate-Source Charge		-	2.0	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	2.8	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = -15V, I_D = -1A, V_{GS} =-10V, R_{GEN}=6Ω	-	14	-	ns
t_r	Turn-on Rise Time		-	12	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	56	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-5.1	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-20	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -5.1A	-	-	-1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width≤300µs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

-I_D (A)

-V_{DS}(V)

Curves labeled: -10V, -5V, -4.5V, -4V, -3.5V, V_{GS}=-3V
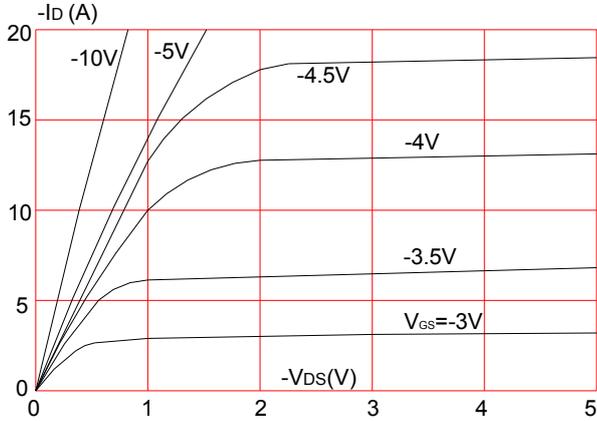
Figure 2: Typical Transfer Characteristics

-I_D (A)

-V_{GS}(V)

T_J=25℃

T_J=125℃
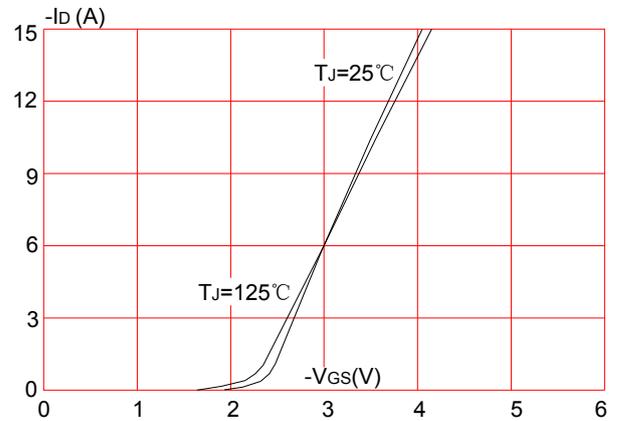
Figure 3: On-resistance vs. Drain Current

$R_{DS(ON)}$ (mΩ)

-I_D(A)

V_{GS}= -4.5V

V_{GS}= -10V
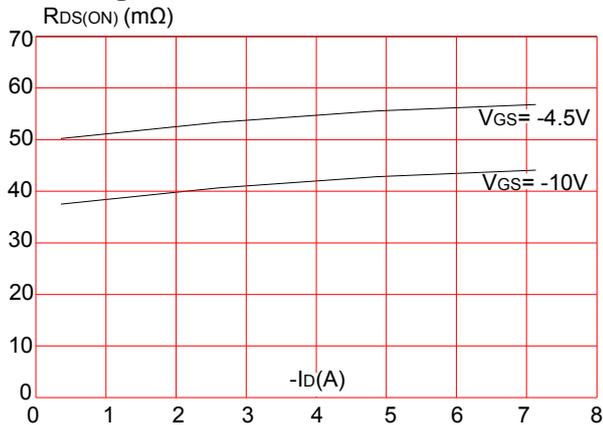
Figure 4: Body Diode Characteristics

-I_S(A)

-V_{SD}(V)

T_J=150℃

T_J=-25℃

T_J=-50℃
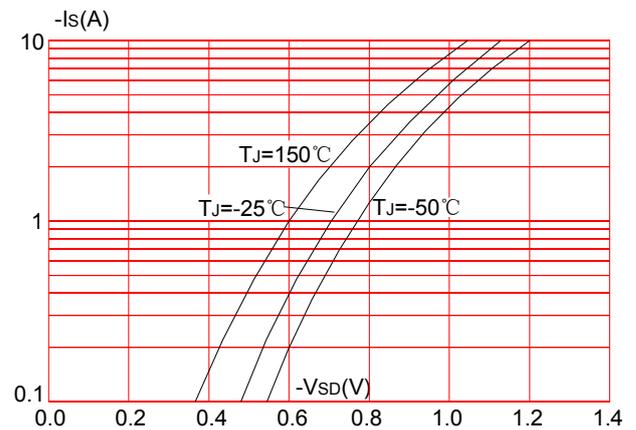
Figure 5: Gate Charge Characteristics

-V_{GS}(V)

V_{GS}=-10V
I_D=-5.1A

Q_g(nC)
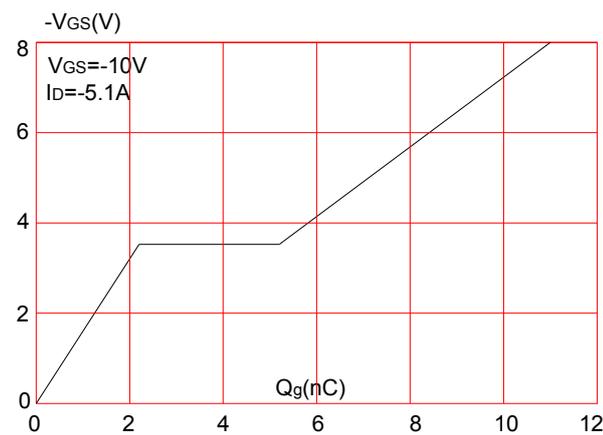
Figure 6: Capacitance Characteristics

C(pF)

-V_{DS}(V)

C_{iss}

C_{oss}

C_{rss}
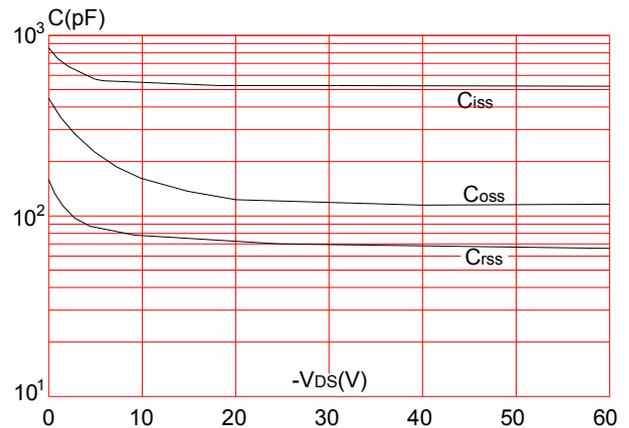
Typical Performance Characteristics (cont.)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

$V_{BR(DSS)}(V)$

Tj (℃)
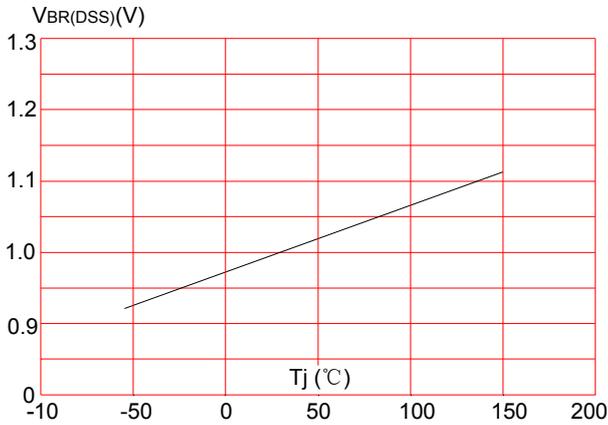
Figure 8: Normalized on Resistance vs. Junction Temperature

$R_{DS(on)}(m\Omega)$

Tj (℃)
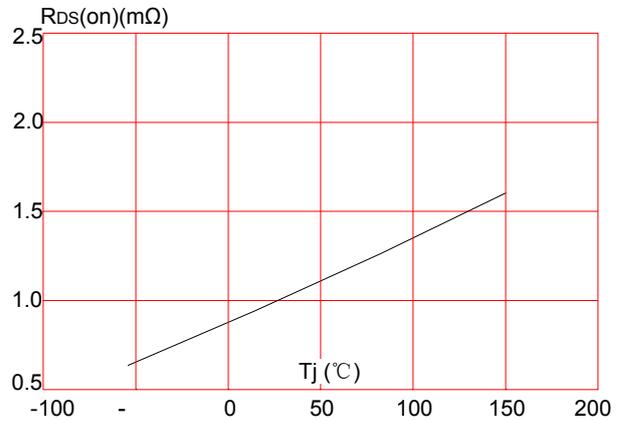
Figure 9: Maximum Safe Operating Area

$-I_D(A)$

Limited by $R_{DS(on)}$

10µs
100µs
1ms
10ms
100ms
DC

$T_C=25℃$
Single pulse

$-V_{DS}$ (V)
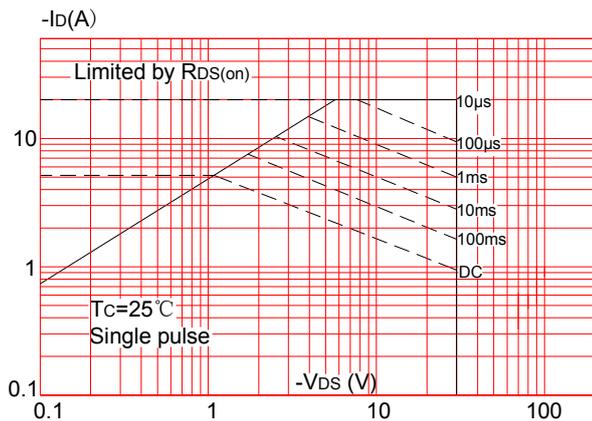
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

$-I_D(A)$

Tc (℃)
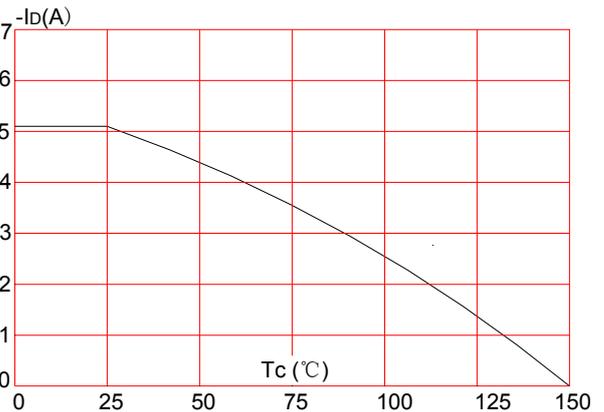
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOP-8)

$Zth_{J-C}(℃/W)$

D=0.5
D=0.2
D=0.1
D=0.05
D=0.02
D=0.01
Single pulse

$T_P(s)$

P_{DM} t1
t2

Notes:
1.Duty factor D=t1/t2
2.Peak $T_J=P_{DM}*Z_{thJC}+T_C$
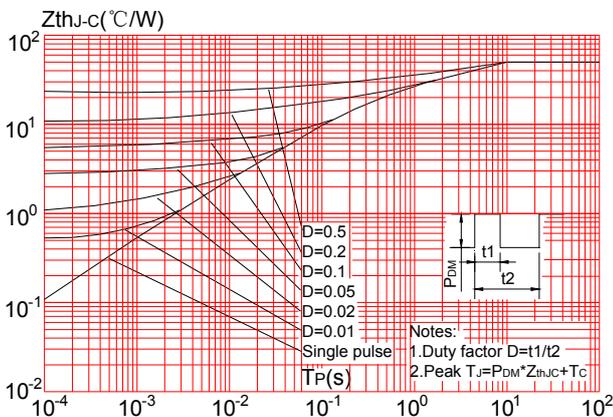
SOP-8 Package Information
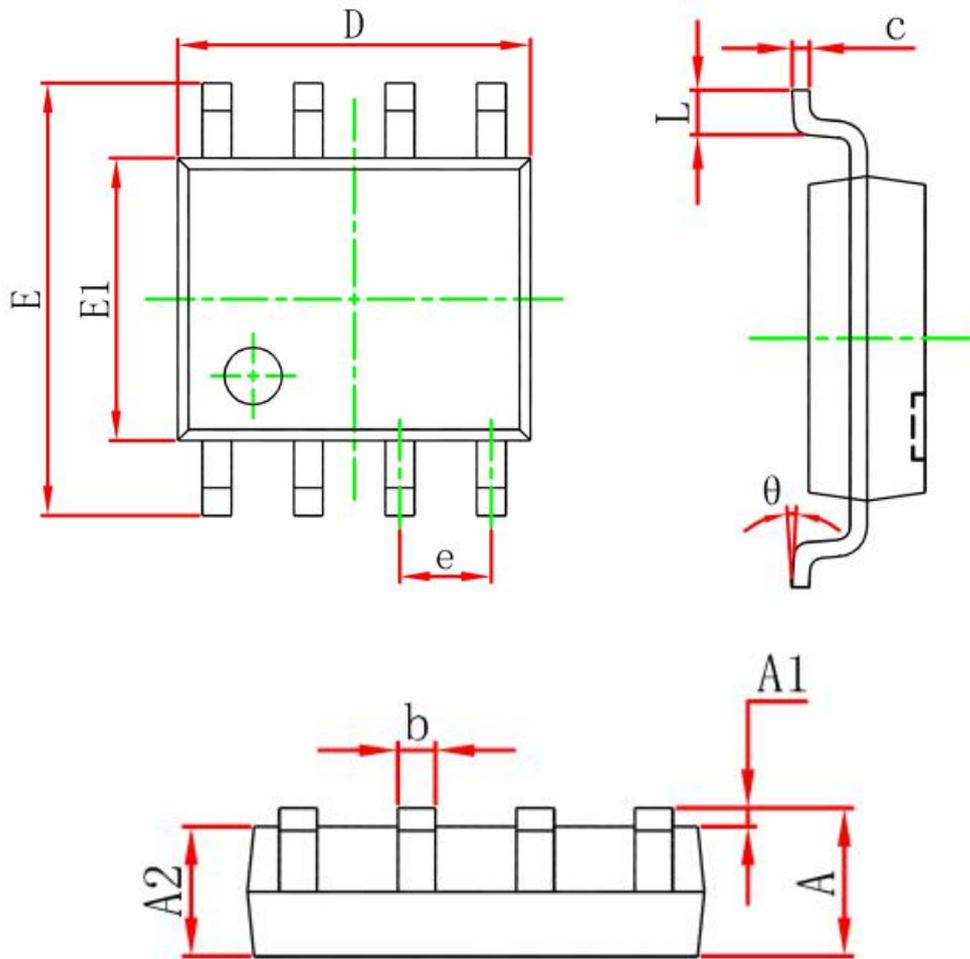
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.450	1.750	0.057	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E1	3.800	4.000	0.150	0.157
E	5.800	6.200	0.228	0.244
e	1.27(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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