N-Channel MOSFET
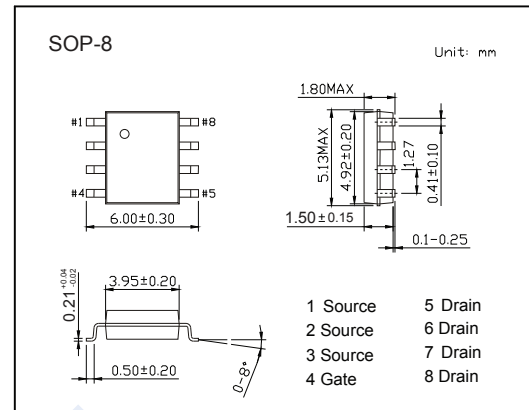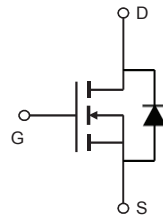
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■ Features

● V_{DS} = 40 V

● I_D (at V_{GS}=10V) = 15.0 A

● $R_{DS(ON)}$ (at V_{GS} = 10 V) < 6 mΩ

● $R_{DS(ON)}$ (at V_{GS} = 4.5 V) < 8.5 mΩ

● Simple Drive Requirement

● Fast Switching Characteristic

SOP-8   Unit: mm

1.80MAX
5.13MAX
4.92±0.20
1.27
0.41±0.10
6.00±0.30
1.50±0.15
0.1~0.25
0.21 +0.04 -0.02
3.95±0.20
0.50±0.20
0~8°

1 Source	5 Drain
2 Source	6 Drain
3 Source	7 Drain
4 Gate	8 Drain

■ Absolute Maximum Ratings (T$_A$ = 25℃ unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (Note 3)	T$_A$ = 25℃	I_D	15.0	A
	T$_A$ = 70℃		12.0	
Pulsed Drain Current (Note 1)		I_{DM}	60	
Thermal Resistance, Junction- to-Ambient (Note 3)		$R_{\theta JA}$	50	℃/W
Power Dissipation		P_D	2.5	W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

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■ Electrical Characteristics (TJ = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV$_{DSS}$	I$_D$ = 250 µA, V$_{GS}$ = 0V	40			V
Zero Gate Voltage Drain Current	I$_{DSS}$	V$_{DS}$ = 40 V, V$_{GS}$ = 0 V			1	µA
		V$_{DS}$ = 32 V, V$_{GS}$ = 0 V, TJ=55℃			10	
Gate to Source Leakage Current	I$_{GSS}$	V$_{DS}$ = 0 V, V$_{GS}$ = ±20 V			±100	nA
Gate to Source Threshold Voltage	V$_{GS(th)}$	V$_{DS}$ = V$_{GS}$, I$_D$ = 250µA	0.5		2.0	V
Static Drain-Source On-Resistance (Note 2)	R$_{DS(On)}$	V$_{GS}$ = 10 V, I$_D$ = 15 A			6	mΩ
		V$_{GS}$ = 4.5 V, I$_D$ = 7 A			8.5	
Forward Transconductance	g$_{FS}$	V$_{DS}$ = 10 V, I$_D$ = 15 A		14		S
Dynamic Characteristics						
Input Capacitance	C$_{iss}$	V$_{GS}$ = 0 V, V$_{DS}$ = 25 V, f = 1 MHz		2300		pF
Output Capacitance	C$_{oss}$			371		
Reverse Transfer Capacitance	C$_{rss}$			320		
Gate Resistance	R$_g$	V$_{GS}$=0V, V$_{DS}$=0V, f = 1MHz		1.8	2.7	Ω
Switching Characteristics						
Total Gate Charge	Q$_g$	V$_{GS}$ = 4.5 V, V$_{DS}$ = 32 V, I$_D$ = 14 A		30	55	nC
Gate Source Charge	Q$_{gs}$			4		
Gate Drain Charge	Q$_{gd}$			17		
Turn-On DelayTime	t$_{d(on)}$	V$_{DS}$ = 20 V, I$_D$ = 1 A, R$_G$ = 3.3 Ω, V$_{GS}$ = 10 V, R$_D$ = 20 Ω		11		ns
Turn-On Rise Time	t$_r$			7		
Turn-Off DelayTime	t$_{d(off)}$			58		
Turn-Off Fall Time	t$_f$			26		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t$_{rr}$	I$_F$ = 14 A, dI/dt = 100 A/µs		29		ns
Body Diode Reverse Recovery Charge	Q$_{rr}$			34		nC
Diode Forward Voltage	V$_{SD}$	V$_{GS}$ = 0 V, I$_S$ = 2.1 A			1.2	V

Notes:

1. Pulse width limited by Max. junction temperature.

2. Pulse test.

3. Surface mounted on 1 in^2 copper pad of FR4 board, t <10sec ; 125 ℃/W when mounted on Min. copper pad.

■ Marking

Marking	K7112 KC****

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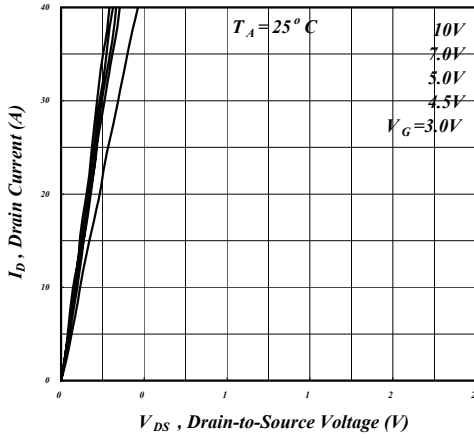■ Typical Characterisitics

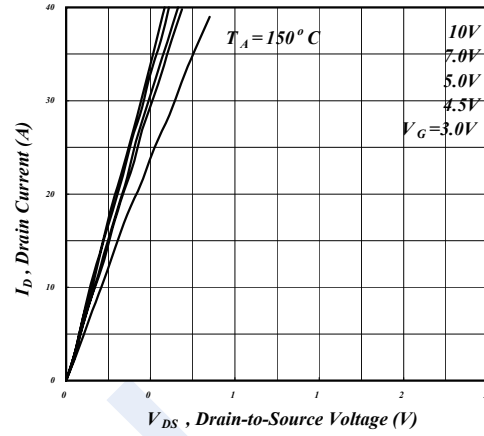Fig 1. Typical Output Characteristics
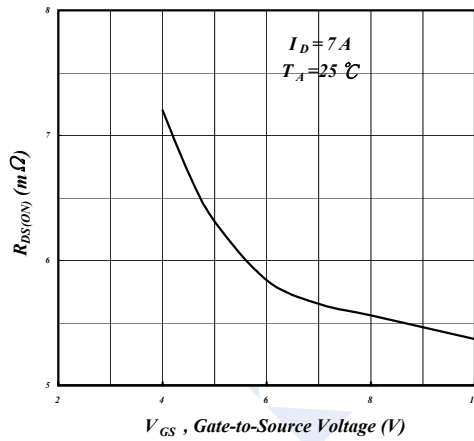

Fig 2. Typical Output Characteristics

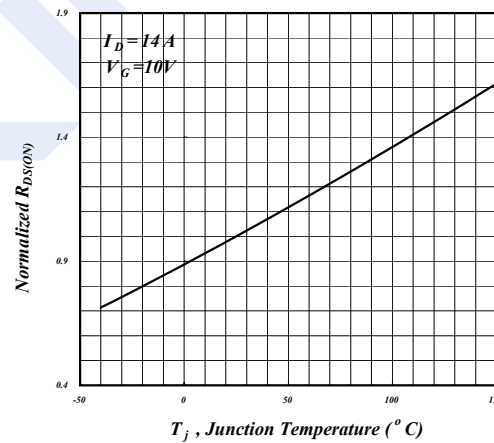Fig 3. On-Resistance v.s. Gate Voltage

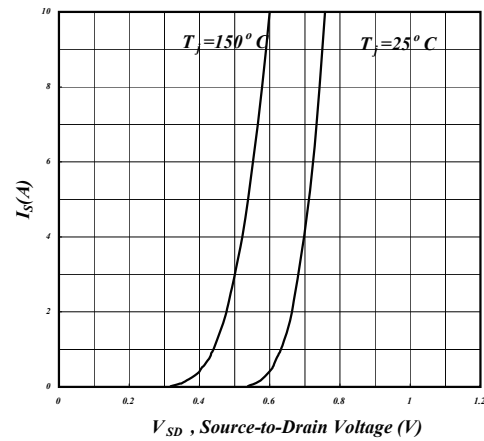
Fig 4. Normalized On-Resistance
v.s. Junction Temperature
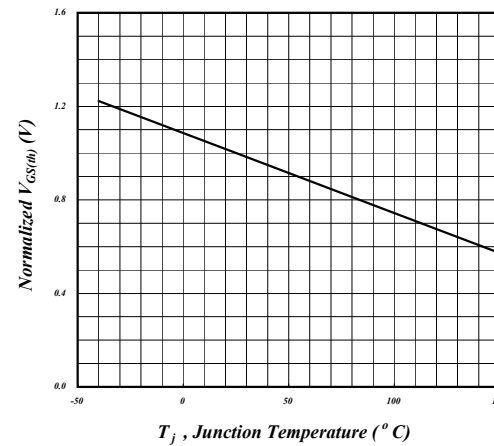

Fig 5. Forward Characteristic of
Reverse Diode

Fig 6. Gate Threshold Voltage v.s.
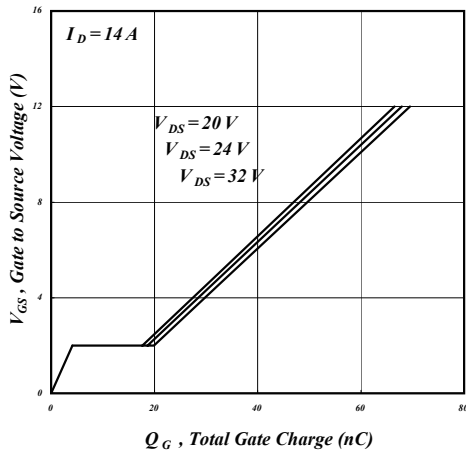Junction Temperature

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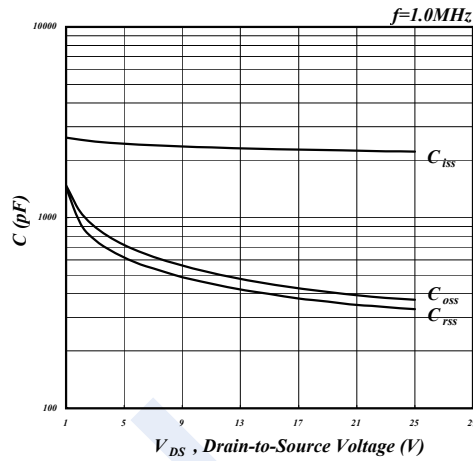
■ Typical Characterisitics

Fig 7. Gate Charge Characteristics

Fig 8. Typical Capacitance Characteristics
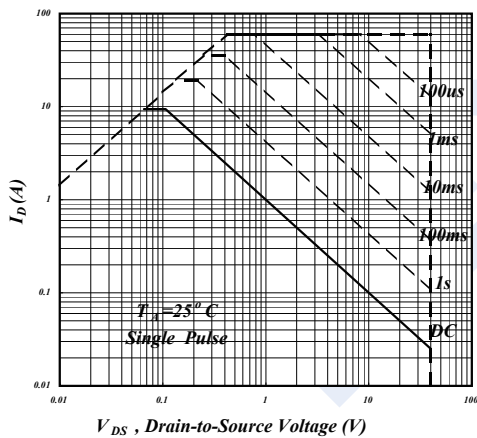

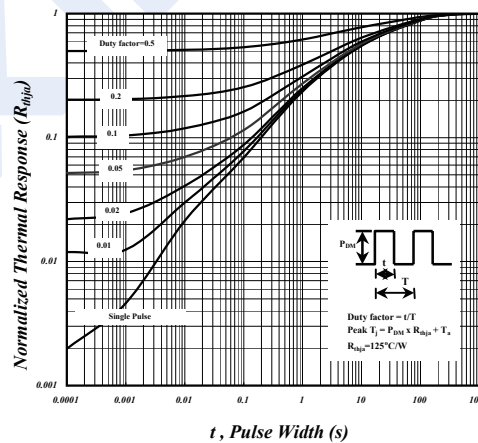**Fig 9. Maximum Safe Operating Area**
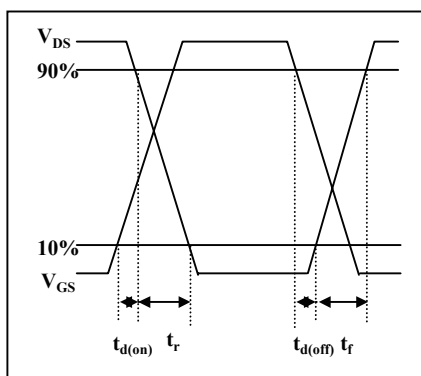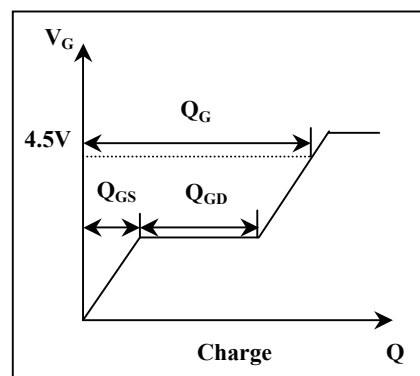

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform