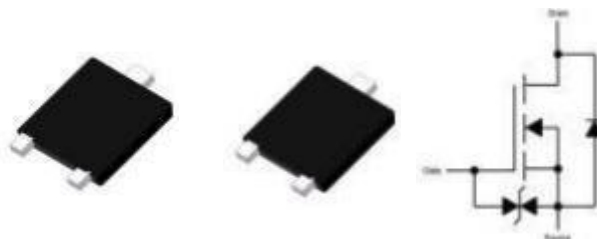


■ Features

- Advanced Trench Process Technology
- Low Threshold Voltage
- Fast Switching Speed
- Halogen-Free & Lead-Free
- N-Channel Switch with Low $R_{DS(on)}$



■ Application

- Load Switch for Portable Devices
- Voltage controlled small signal switch



SOT-723

Marking: KF

■ Absolute Maximum Ratings (at $T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Cure	I_D	0.75	A
Peak Drain Current, Pulsed ¹⁾	I_{DM}	1.8	A
Power Dissipation ²⁾	P_{tot}	0.15	W
Operating Junction	T_J	-55~ 150	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-55~ 150	$^{\circ}\text{C}$

■ Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	833	$^{\circ}\text{C/W}$

1) Pulse width $\leq 100\mu\text{s}$, duty cycle $\leq 1\%$, limited by T_{Jmax}

2) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

■ Characteristics at $T_a=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250\ \mu\text{A}$	BV_{DS}	20			V
Drain-Source Leakage Current at $V_{DS} = 24\ \text{V}$	$IDSS$			1	μA
Gate Leakage Current at $V_{GS} = \pm 10\ \text{V}$	$IGSS$			± 10	μA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	$V_{GS(th)}$	0.35	0.7	1.1	V
Drain-Source On-State Resistance at $V_{GS} = 4.5\ \text{V}$, $I_D = 0.65\ \text{A}$ at $V_{GS} = 2.5\ \text{V}$, $I_D = 0.45\ \text{A}$ at $V_{GS} = 1.8\ \text{V}$, $I_D = 0.25\ \text{A}$	$R_{DS(on)}$		170 230 350	330 400 750	$\text{m}\Omega$
DYNAMIC PARAMETERS					
Forward Transconductance at $V_{DS} = 10\ \text{V}$, $I_D = 800\text{mA}$	g_{fs}		1.6		S
Input Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 16\ \text{V}$, $f = 1\ \text{MHz}$	C_{iss}		79		pF
Output Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 16\ \text{V}$, $f = 1\ \text{MHz}$	C_{oss}		13		pF
Reverse Transfer Capacitance at $V_{GS} = 0\ \text{V}$, $V_{DS} = 16\ \text{V}$, $f = 1\ \text{MHz}$	C_{rss}		9		pF
Gate charge tota at $V_{DS} = 10\ \text{V}$, $I_D = 0.9\ \text{A}$, $V_{GS} = 4.5\ \text{V}$	Q_g		1		nC
Gate to Source Charge at $V_{DS} = 10\ \text{V}$, $I_D = 0.9\ \text{A}$, $V_{GS} = 4.5\ \text{V}$	Q_{gs}		0.28		nC
Gate to Drain Charge at $V_{DS} = 10\ \text{V}$, $I_D = 0.9\ \text{A}$, $V_{GS} = 4.5\ \text{V}$	Q_{gd}		0.22		nC
Turn-On Delay Time at $V_{GS} = 4.5\ \text{V}$, $V_{DS} = 10\ \text{V}$, $I_D = 0.5\ \text{A}$, $R_g = 10\ \Omega$	$t_{d(on)}$		6.7		ns
Turn-On Rise Time at $V_{GS} = 4.5\ \text{V}$, $V_{DS} = 10\ \text{V}$, $I_D = 0.5\ \text{A}$, $R_g = 10\ \Omega$	t_r		4.8		ns
Turn-Off Delay Time at $V_{GS} = 4.5\ \text{V}$, $V_{DS} = 10\ \text{V}$, $I_D = 0.5\ \text{A}$, $R_g = 10\ \Omega$	$t_{d(off)}$		17.3		ns
Turn-Off Fall Time at $V_{GS} = 4.5\ \text{V}$, $V_{DS} = 10\ \text{V}$, $I_D = 0.5\ \text{A}$, $R_g = 10\ \Omega$	t_f		7.4		ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 150\ \text{mA}$, $V_{GS} = 0\ \text{V}$	V_{DS}			1.2	V
Body Diode Reverse Recovery Time at $I_F = 3.6\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	t_{rr}		7.5		ns
Body Diode Reverse Recovery Charge at $I_F = 3.6\ \text{A}$, $di/dt = 100\ \text{A} / \mu\text{s}$	Q_{rr}		2.5		nC

■ Electrical Characteristics Curves

Fig. 1 - Output Characteristics

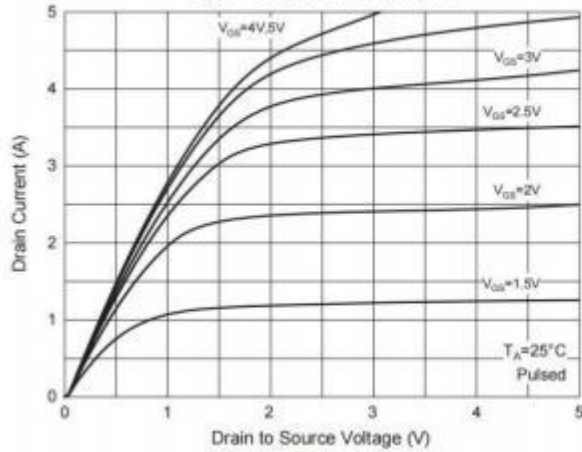


Fig. 2 - Transfer Characteristics

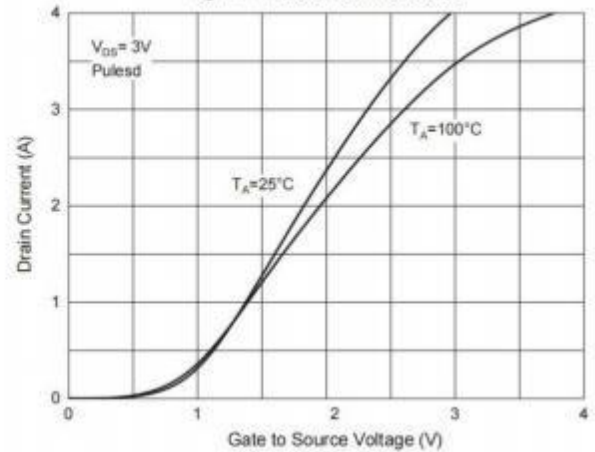


Fig. 3 - $R_{DS(ON)}-I_D$

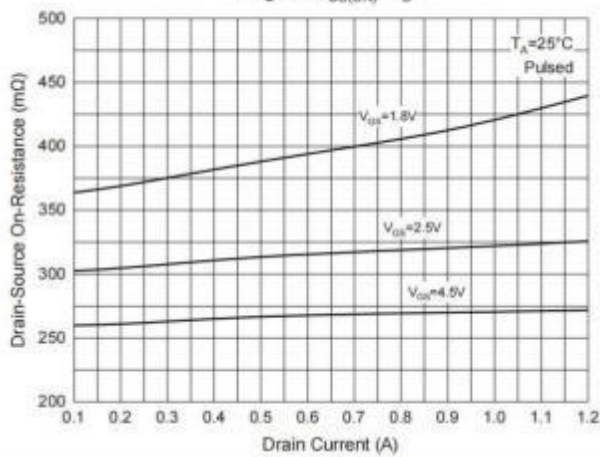


Fig. 4 - $R_{DS(ON)}-V_{GS}$

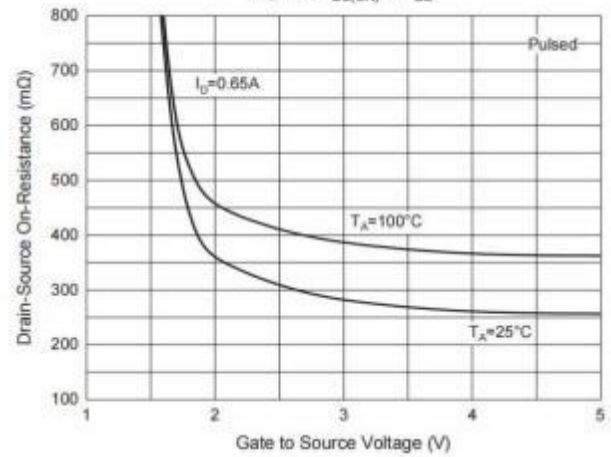


Fig. 5 - I_S-V_{SD}

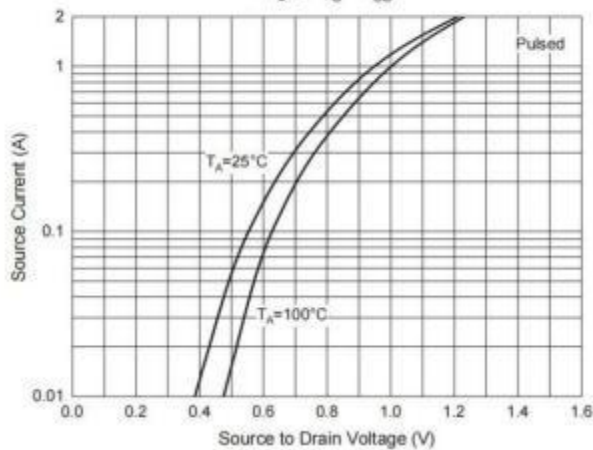
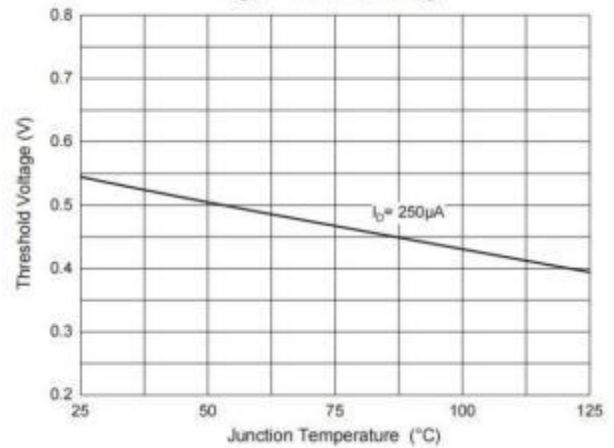


Fig. 6 - Threshold Voltage



■ Test Circuits

Fig. 1-1 Switching times test circuit

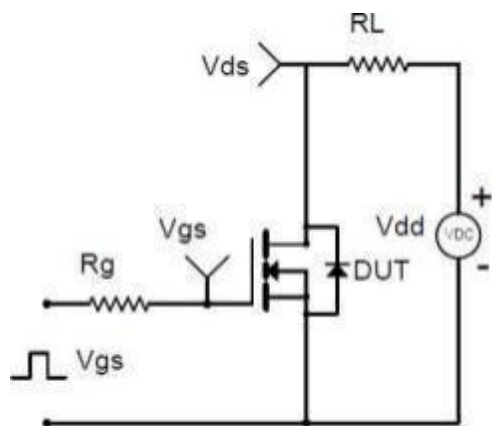


Fig. 1-2 Switching Waveform

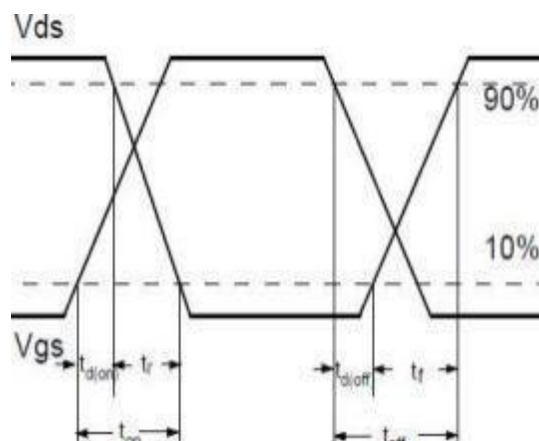


Fig.2-1 Gate charge test circuit

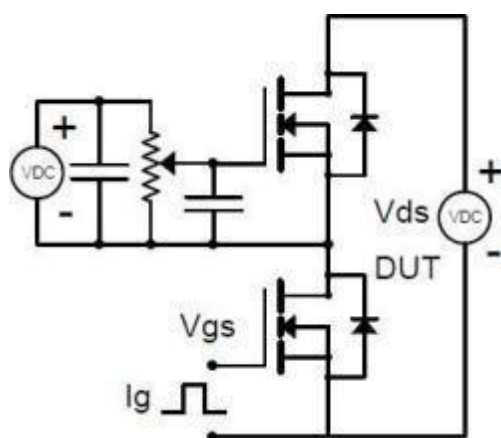


Fig.2-2 Gate charge waveform

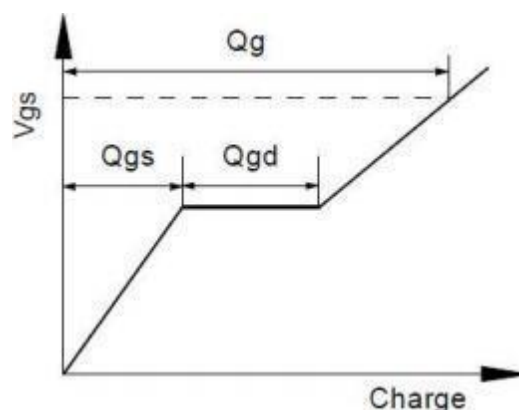


Fig.3-1 Avalanche test circuit

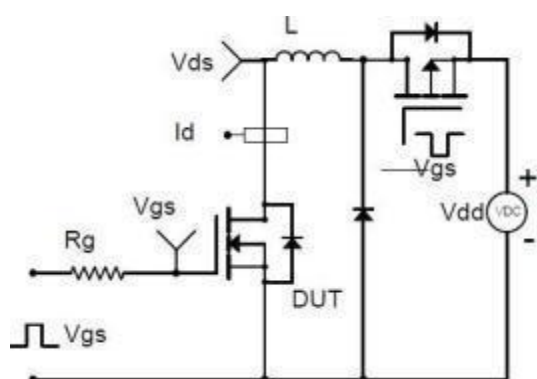
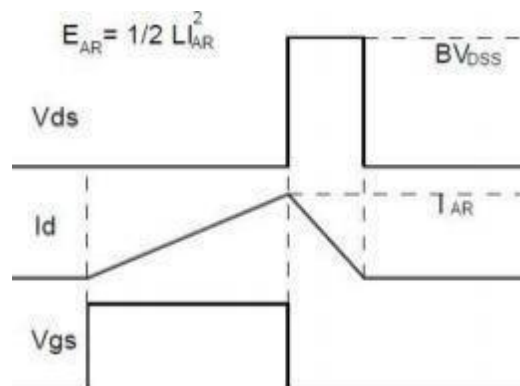
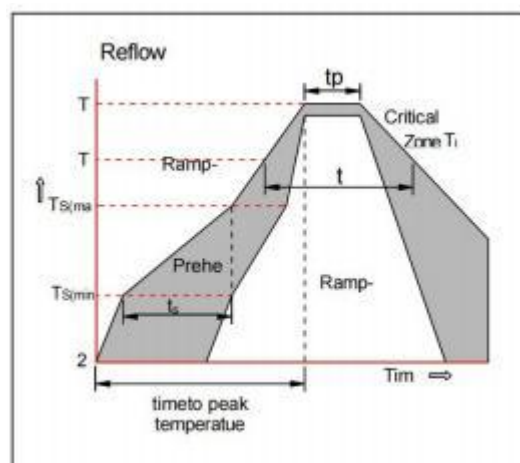


Fig.3-2 Avalanche waveform

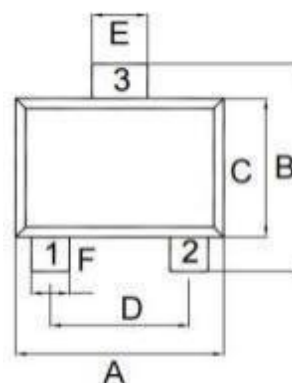
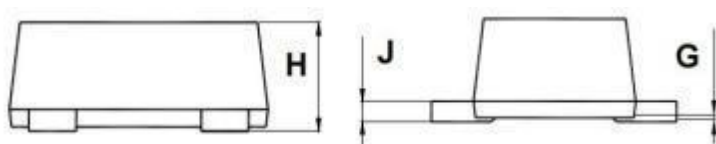


■ Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



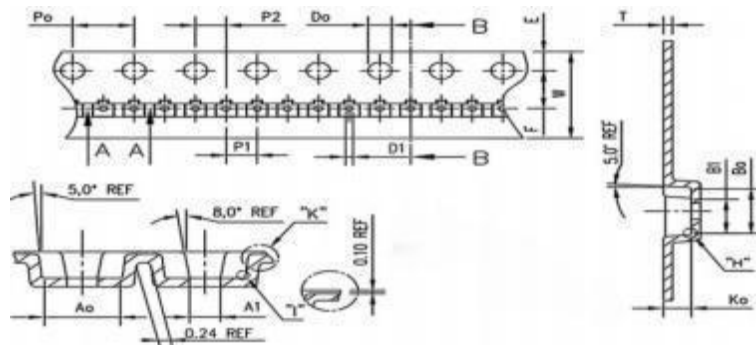
■ Package Outline Dimensions (Units: mm)



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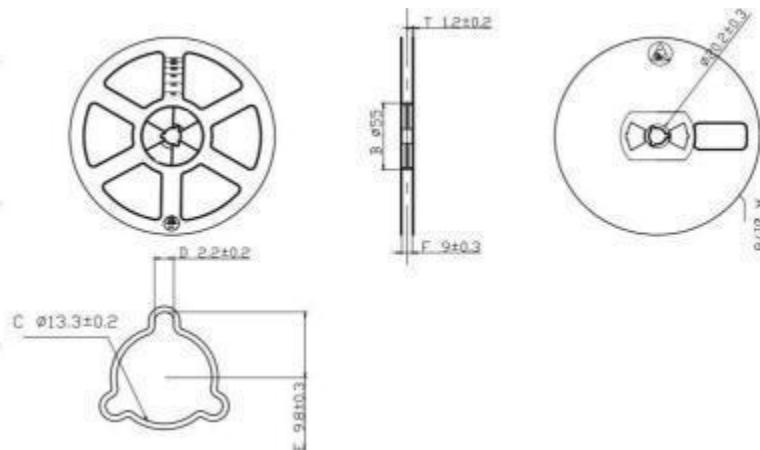
UNIT	A	B	C	D	E	F	G	H	J
mm	1.10 1.30	1.10 1.30	0.90 0.90	0.80	0.22 0.42	0.12 0.32	0.00 0.05	0.43 0.54	0.08 0.15

■ Emboss Carrier Tape



UNIT	A0	A1	B0	B1	K0	P0	P1
mm	1.35	0.45	1.4	1.08	0.56	3.9	1.95
	1.41	0.55	1.5	1.18	0.66	4.1	2.05
UNIT	P2	E	F	W	T	D0	D1
mm	1.95	1.65	3.45	7.9	0.15	1.4	0.45
	2.05	1.85	3.55	8.3	0.25	1.6	0.55

■ Reel



尺寸	A	B	C	D	E	F	T	重量
标准值	178.00	55.00	13.30	2.20	9.80	9.00	1.20	46g
公差	±0.05	±0.20	±0.20	±0.20	±0.30	±0.30	±0.20	±3