

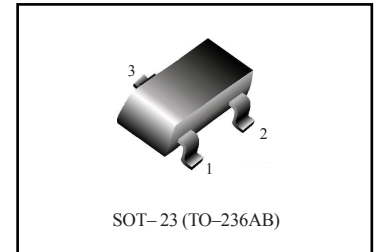
# Small Signal MOSFET

## 115 mAmps, 60 Volts

N-Channel SOT-23

• **Features**

- 1) Low on-resistance. (MAX 7.5Ω)
- 2) Fast switching speed.
- 3) Low-voltage drive.
- 4) Easily designed drive circuits.
- 5) Easy to parallel.
- 6) Pb-Free package is available.
- 7) Esd Protected : 2000V



• **Device Marking and Ordering Information**

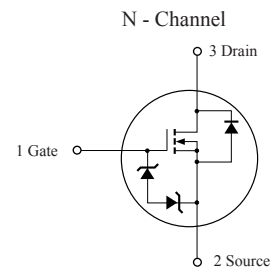
Device	Marking	Shipping
FTK7002E	RK	3000 Tape & Reel
FTK7002E	RK	10000 Tape & Reel

• **Absolute maximum ratings** (T<sub>A</sub> = 25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V <sub>DSS</sub>	60	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current	Continuous	I <sub>D</sub>	115 mA
	Pulsed	I <sub>DP</sub> *1	0.8 A
Drain reverse current	Continuous	I <sub>DR</sub>	115 mA
	Pulsed	I <sub>DRP</sub> *1	0.8 A
Total Power Dissipation	P <sub>D</sub> *2	225	mW
Channel temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +150	°C

\*1. P<sub>w</sub> ≤ 10μs, Duty cycle ≤ 1%

\*2. When mounted on a 1 × 0.75 × 0.062 inch glass epoxy board.



● ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>						
Gate-Source Leakage Current	( $V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$ )	$I_{GSS}$	-	-	$\pm 10$	$\mu\text{A}$
Drain-Source Breakdown Voltage	( $V_{GS} = 0\text{ V}, I_D = 10\mu\text{A}$ )	$V_{(BR)DSS}$	60	-	-	V
Zero Gate Voltage Drain Current	( $V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$ )	$I_{DSS}$	-	-	1	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	( $V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$ )	$V_{GS(th)}$	1	1.85	2.5	V
Drain-Source On-State Resistance	( $V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$ )	$R_{DS(on)*}$	-	-	7.5	$\Omega$
	( $V_{GS} = 5\text{ V}, I_D = 0.05\text{ mA}$ )		-	-	7.5	
Forward Transfer admittance	( $V_{DS} = 10\text{ V}, I_D = 0.2\text{ A}$ )	$ Y_{FS} $	80	-	-	mS
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	( $V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$ )	$C_{iss}$	-	25	50	pF
Output Capacitance	( $V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$ )	$C_{oss}$	-	10	25	pF
Reverse Transfer Capacitance	( $V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$ )	$C_{rss}$	-	3.0	5.0	pF
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	( $V_{DD} = 30\text{ V}, I_D = 200\text{ mA},$ $V_{GS} = 10\text{ V}, R_{GS} = 10\Omega, R_L = 150\Omega$ )	$t_{d(on)*}$	-	12	20	ns
Turn-Off Delay Time		$t_{d(off)*}$	-	20	30	ns

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .

● ELECTRICAL CHARACTERISTICS CURVES

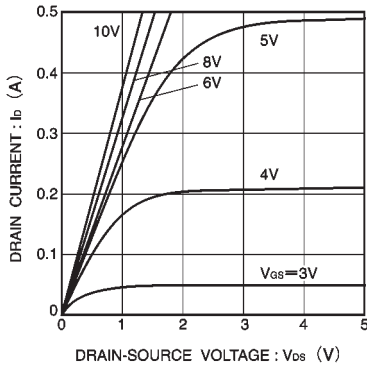


Fig.1 Typical output characteristics

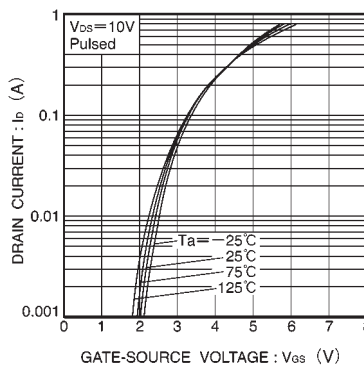


Fig.2 Typical transfer characteristics

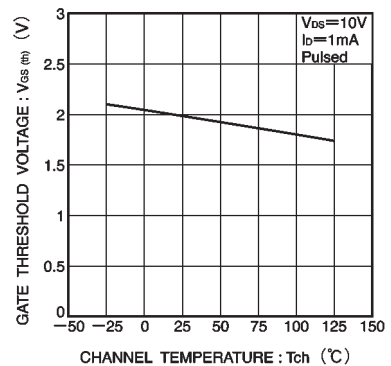


Fig.3 Gate threshold voltage vs. channel temperature

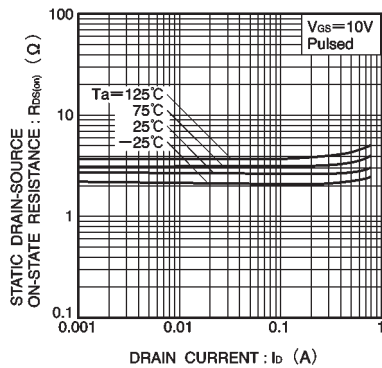


Fig.4 Static drain-source on-state resistance vs. drain current ( I )

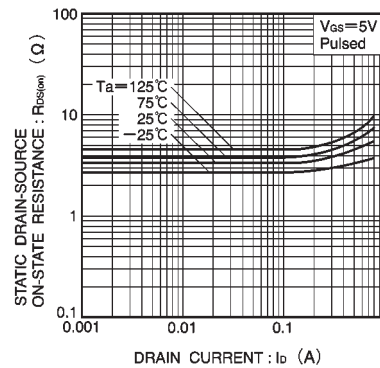


Fig.5 Static drain-source on-state resistance vs. drain current ( II )

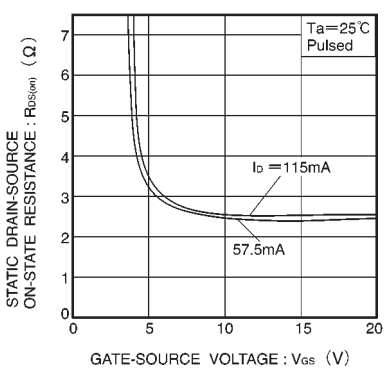


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

● ELECTRICAL CHARACTERISTICS CURVES (Continues)

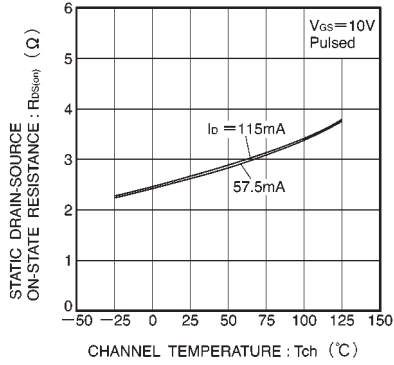


Fig.7 Static drain-source on-state resistance vs. channel temperature

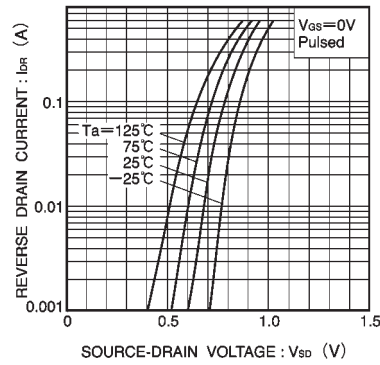


Fig.8 Reverse drain current vs. source-drain voltage ( I )

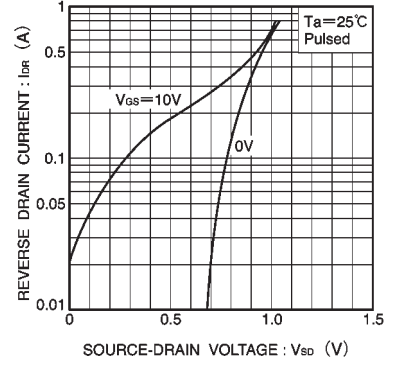


Fig.9 Reverse drain current vs. source-drain voltage ( II )

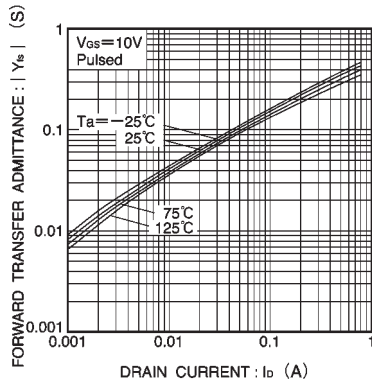


Fig.10 Forward transfer admittance vs. drain current

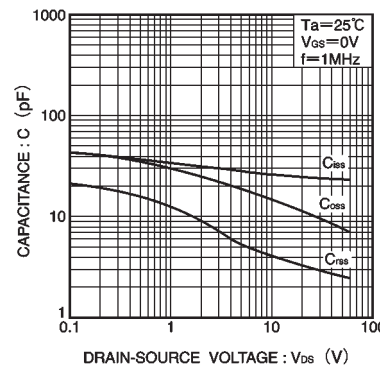


Fig.11 Typical capacitance vs. drain-source voltage

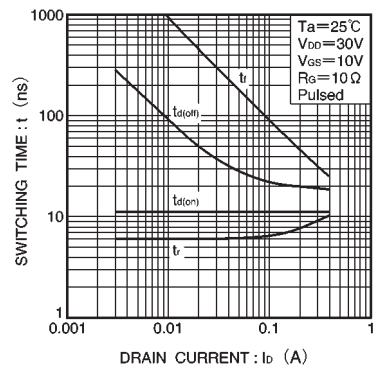


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

● SWITCHING CHARACTERISTICS MEASUREMENT CIRCUIT

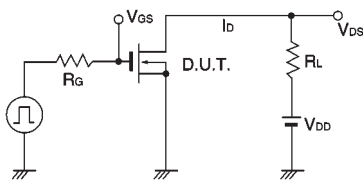


Fig.13 Switching time measurement circuit

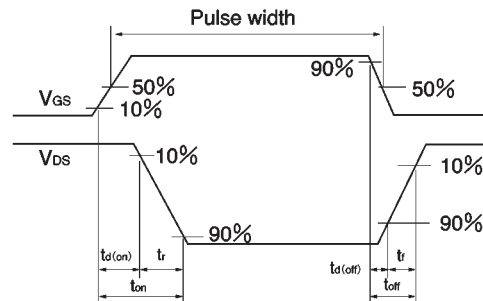
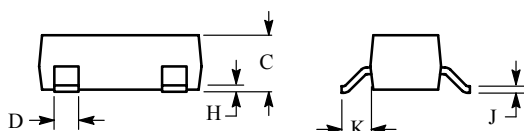
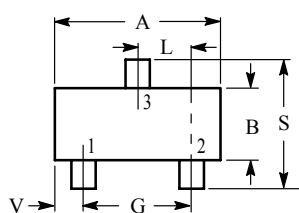


Fig.14 Switching time waveforms

## SOT-23

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

