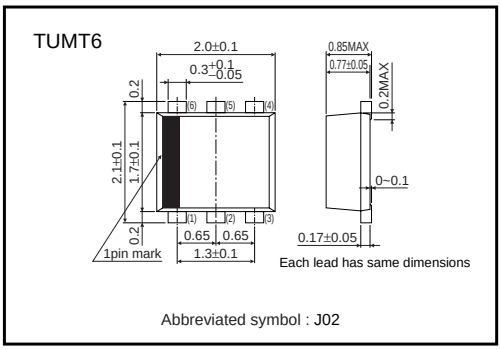
Small switching (–20V, –1A)

US6J2

●Features

1) Two Pch MOSFET transistors in a single TUMT6 package.
2) Mounting cost and area can be cut in half.
3) Low on-resistance.
4) Low voltage drive (2.5V) makes this device ideal for portable equipment.
5) Easily designed drive circuits.

●External dimensions (Unit : mm)



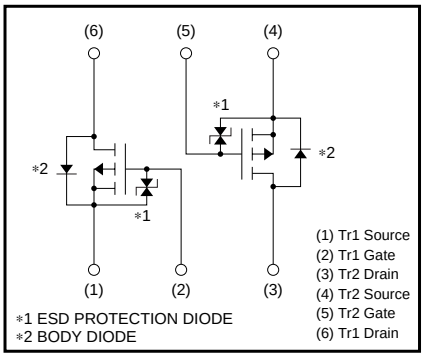
●Applications

switch

●Structure

Silicon P-channel
MOS FET

●Equivalent circuit



●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
US6J2		○

●**Absolute maximum ratings** (Ta=25°C)

Parameter		Symbol	Limits	Unit	
Drain-source voltage		V_{DSS}	−20	V	
Gate-source voltage		V_{GSS}	±12	V	
Drain current	Continuous	I_D	±1	A	
	Pulsed	I_{DP}	±4	A	*1
Source current (Body diode)	Continuous	I_S	−0.4	A	*1
	Pulsed	I_{SP}	−1.6	A	
Total power dissipation		P_D	1.0	W	*2
Channel temperature		Tch	150	°C	
Range of Storage temperature		Tstg	−55 to +150	°C	

*1 Pw≤10µs, Duty cycle≤50%
*2 Mounted on a ceramic board

●**Electrical characteristics** (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±10	µA	V_{GS}=±12V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	−20	–	–	V	I_D= −1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	−1.0	µA	V_{DS}= −20V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	−0.7	–	−2.0	V	V_{DS}= −10V, I_D= −1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$	–	280	390	mΩ	I_D= −1A, V_{GS}= −4.5V
		–	310	430	mΩ	I_D= −1A, V_{GS}= −4V
		–	570	800	mΩ	I_D= −0.5A, V_{GS}= −2.5V
Forward transfer admittance	$\|Y_{fs}\|$	0.7	–	–	S	V_{DS}= −10V, I_D= −0.5A
Input capacitance	C_{iss}	–	150	–	pF	V_{DS}= −10V
Output capacitance	C_{oss}	–	20	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	20	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$	–	9	–	ns	I_D= −0.5A V_{DD}≒ −15V V_{GS}= −4.5V R_L=30Ω R_G=10Ω
Rise time	t_r	–	8	–	ns	
Turn-off delay time	$t_{d\ (off)}$	–	5	–	ns	
Fall time	t_f	–	10	–	ns	
Total gate charge	Q_g	–	2.1	–	nC	V_{DD}≒ −15V R_L=15Ω
Gate-source charge	Q_{gs}	–	0.5	–	nC	V_{GS}= −4.5V R_G=10Ω
Gate-drain charge	Q_{gd}	–	0.5	–	nC	I_D= −1A

●**Electrical characteristic curves**

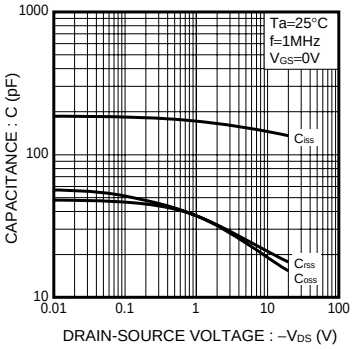


Fig.1 Typical Capacitance vs. Drain-Source Voltage

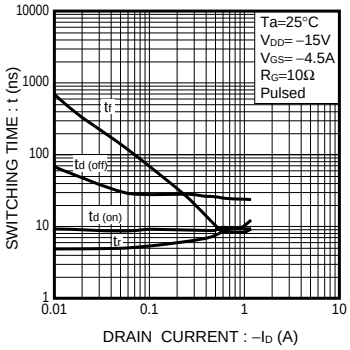


Fig.2 Switching Characteristics

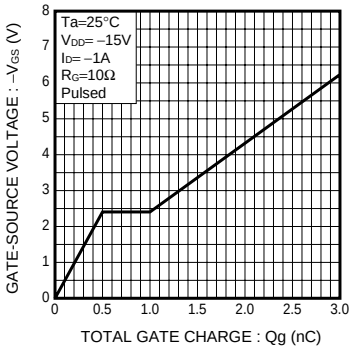


Fig.3 Dynamic Input Characteristics

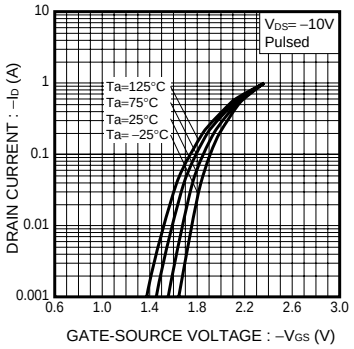


Fig.4 Typical Transfer Characteristics

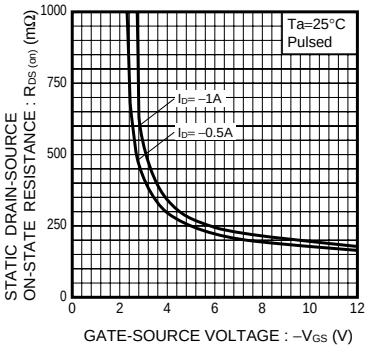


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

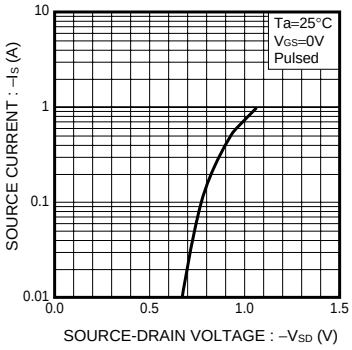


Fig.6 Source Current vs. Source-Drain Voltage

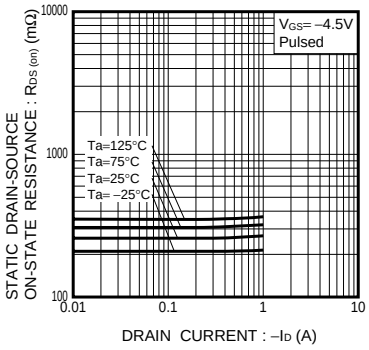


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current (II)

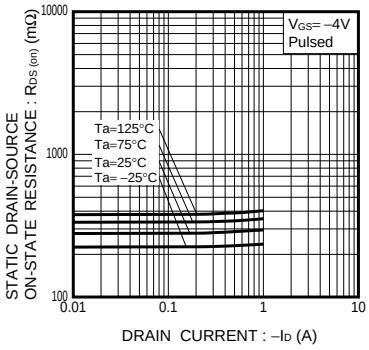


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current (III)

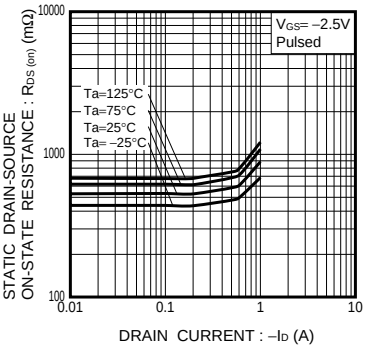


Fig.9 Static Drain-Source On-State Resistance vs. Drain Current (I)

●**Measurement circuits**

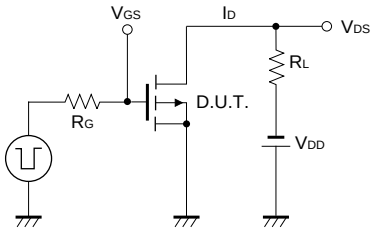


Fig.10 Switching Time Measurement Circuit

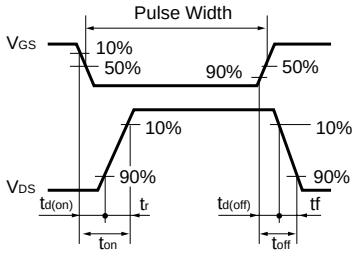


Fig.11 Switching Waveforms

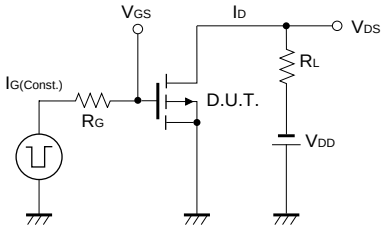


Fig.12 Gate Charge Measurement Circuit

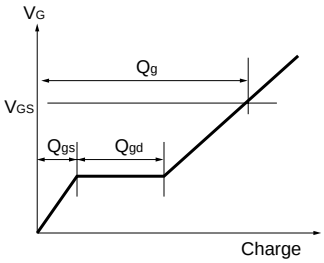


Fig.13 Gate Charge Waveform

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