2.5V Drive Nch+SBD MOSFET

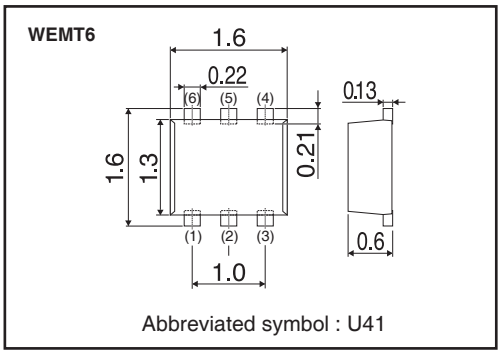
ES6U41

●Structure
Silicon N-channel MOSFET /
Schottky barrier diode

●Features
1) Nch MOSFET and schottky barrier diode-are put in WEMT6 package.
2) High-speed switching, Low On-resistance.
3) Low voltage drive (2.5V drive).
4) Built-in Low V_F schottky barrier diode.

●Applications
Switching

●Dimensions (Unit : mm)

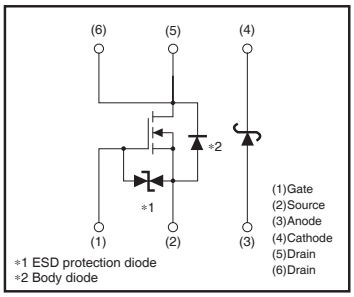


Abbreviated symbol : U41

●Package specifications

Type	Package	Taping
	Code	T2R
	Basic ordering unit (pieces)	8000
ES6U41		◯

●Inner circuit



●Absolute maximum ratings (Ta=25°C)

<MOSFET>

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GSS}	±12	V
Drain current	Continuous	I_D	±1.5	A
	Pulsed	I_{DP} *1	±6.0	A
Source current (Body diode)	Continuous	I_S	0.75	A
	Pulsed	I_{SP} *1	6.0	A
Channel temperature		Tch	150	°C
Power dissipation		P_D *2	0.7	W / ELEMENT

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

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Parameter	Symbol	Limits	Unit
Repetitive peak reverse voltage	V_{RM}	25	V
Reverse voltage	V_R	20	V
Forward current	I_F	0.5	A
Forward current surge peak	I_{FSM} *1	2.0	A
Junction temperature	Tj	150	°C
Power dissipation	P_D *2	0.5	W / ELEMENT

*1 60Hz・1cycle
*2 Mounted on ceramic board

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Parameter	Symbol	Limits	Unit
Power dissipation	P_D *	0.8	W / TOTAL
Range of storage temperature	Tstg	−55 to +150	°C

* Mounted on a ceramic board

●Electrical characteristics

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Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	–	–	±10	μA	V_{GS}=±12V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	30	–	–	V	I_D= 1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	1	μA	V_{DS}= 30V, V_{GS}=0V
Gate threshold voltage	$V_{GS\ (th)}$	0.5	–	1.5	V	V_{DS}= 10V, I_D= 1mA
Static drain-source on-state resistance	$R_{DS\ (on)}$*	–	170	240	mΩ	I_D= 1.5A, V_{GS}= 4.5V
		–	180	250	mΩ	I_D= 1.5A, V_{GS}= 4V
		–	240	340	mΩ	I_D= 1.5A, V_{GS}= 2.5V
Forward transfer admittance	$\|Y_{fs}\|$ *	1.5	–	–	S	V_{DS}= 10V, I_D= 1.5A
Input capacitance	C_{iss}	–	80	–	pF	V_{DS}= 10V
Output capacitance	C_{oss}	–	14	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	12	–	pF	f=1MHz
Turn-on delay time	$t_{d\ (on)}$ *	–	7	–	ns	V_{DD}≒ 15V I_D= 0.75A V_{GS}= 4.5V R_L≒20Ω R_G= 10Ω
Rise time	t_r *	–	9	–	ns	
Turn-off delay time	$t_{d\ (off)}$ *	–	15	–	ns	
Fall time	t_f *	–	6	–	ns	
Total gate charge	Q_g *	–	1.6	2.2	nC	V_{DD}≒15V, V_{GS}= 4.5V
Gate-source charge	Q_{gs} *	–	0.5	–	nC	I_D= 1.5A, R_L≒10Ω
Gate-drain charge	Q_{gd} *	–	0.3	–	nC	R_G= 10Ω

*Pulsed

<Body diode characteristics (Source-drain)>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}	–	–	1.2	V	I_S= 0.75A, V_{GS}=0V

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Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_F	–	–	0.36	V	I_F= 0.1A
		–	–	0.52	V	I_F= 0.5A
Reverse current	I_R	–	–	100	μA	V_R= 20V

●Electrical characteristics curves
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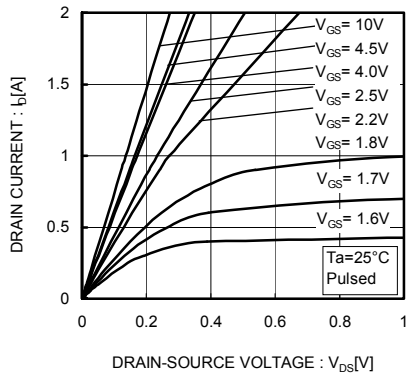

Fig.1 Typical Output Characteristics(Ⅰ)

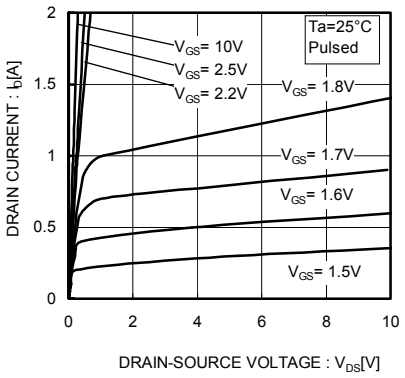

Fig.2 Typical Output Characteristics(Ⅱ)

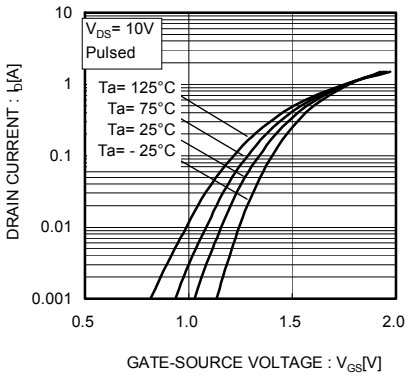

Fig.3 Typical Transfer Characteristics

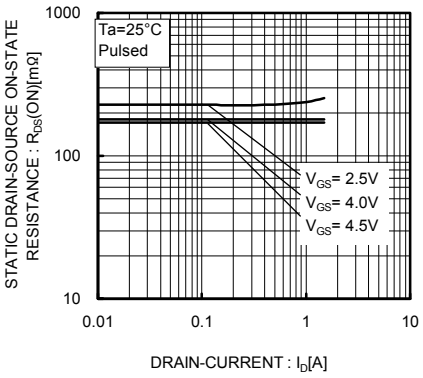

Fig.4 Static Drain-Source On-State Resistance vs. Drain Current(Ⅰ)

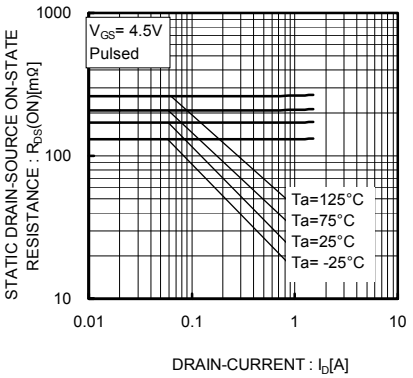

Fig.5 Static Drain-Source On-State Resistance vs. Drain Current(Ⅱ)

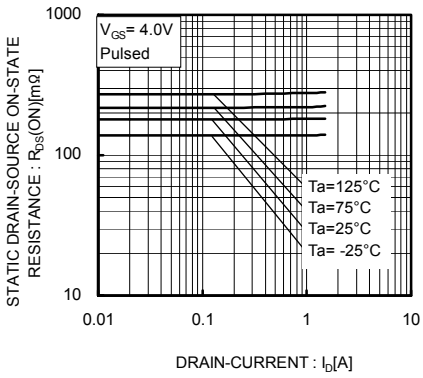

Fig.6 Static Drain-Source On-State Resistance vs. Drain Current(Ⅲ)

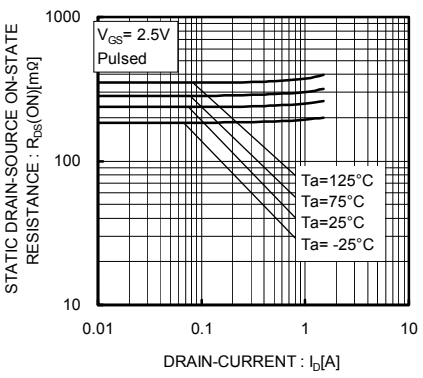

Fig.7 Static Drain-Source On-State Resistance vs. Drain Current(Ⅳ)

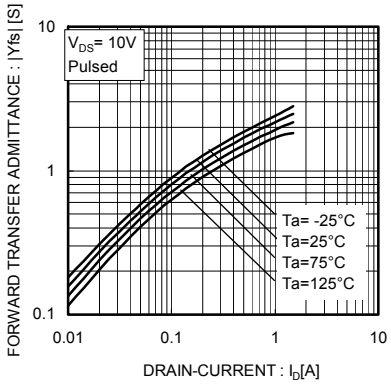

Fig.8 Forward Transfer Admittance vs. Drain Current

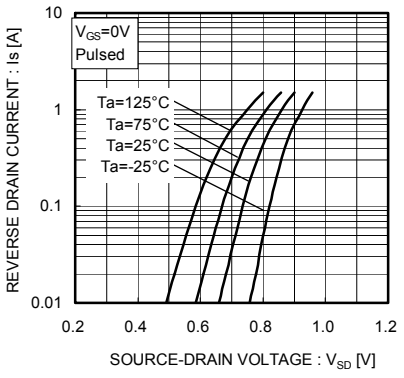

Fig.9 Reverse Drain Current vs. Sourse-Drain Voltage

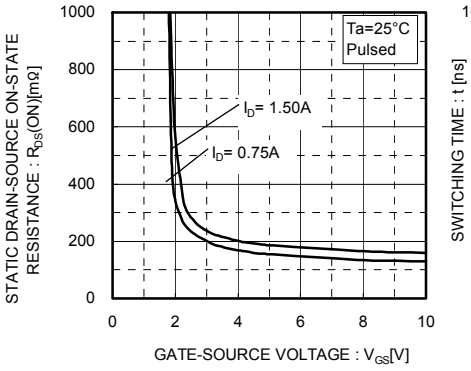

Fig.10 Static Drain-Source On-State Resistance vs. Gate Source Voltage

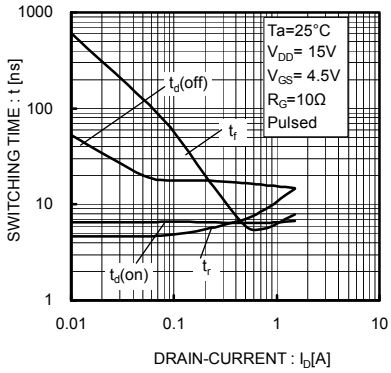

Fig.11 Switching Characteristics

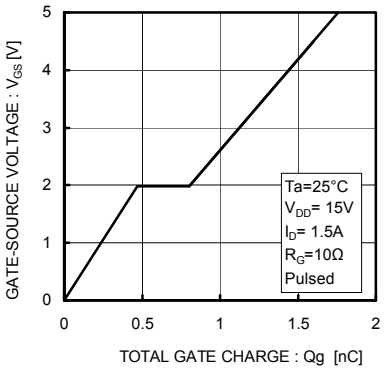

Fig.12 Dynamic Input Characteristics

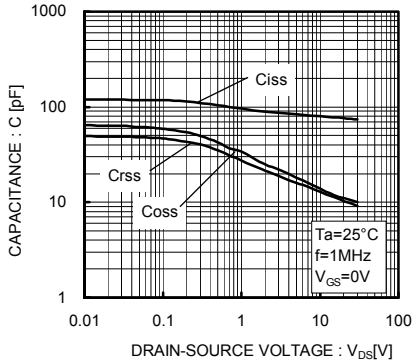

Fig.13 Typical Capacitance vs. Drain-Source Voltage

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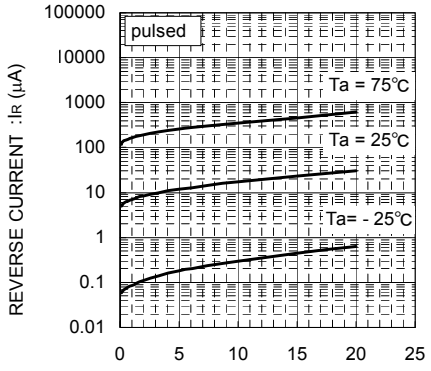

Fig.1 Reverse Current vs. Reverse Voltage

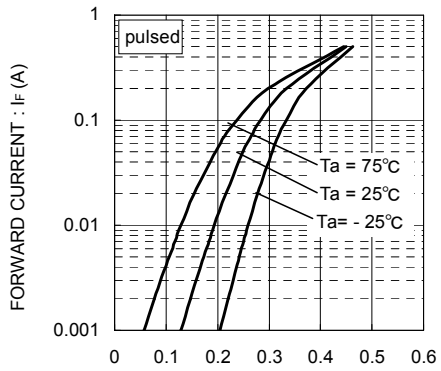

Fig.2 Forward Current vs. Forward Voltage

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