

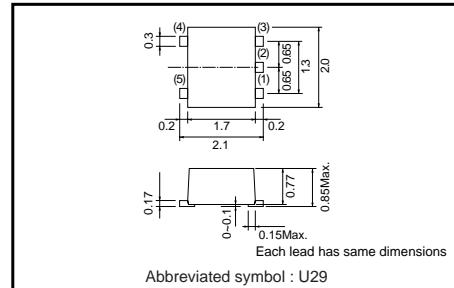
Small switching (-20V, -1.5A)

US5U29

●Features

- 1) The US5U29 combines Pch MOSFET with a Schottky barrier diode in a single TSMT5 package.
- 2) Pch MOSFET have a low on-state resistance with a fast switching.
- 3) Pch MOSFET is reacted a low voltage drive(2.5V)
- 4) The Independently connected Schottky barrier diode have a low forward voltate.

●External dimensions (Unit : mm)



●Applications

Load switch, DC/DC conversion

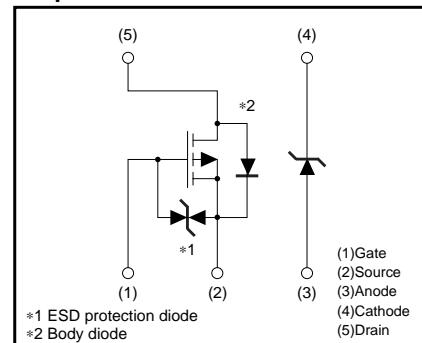
●Structure

Silicon P-channel MOSFET
Schottky Barrier DIODE

●Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
US5U29	○	

●Equivalent circuit



●Absolute maximum ratings (Ta=25°C)

< MOSFET >

Parameter	Symbol	Limits	Unit
Drain-source voltage	V _{DSS}	-20	V
Gate-source voltage	V _{GSS}	±12	V
Drain current	Continuous	I _D	A
	Pulsed	I _{DP}	A
Source current (Body diode)	Continuous	I _S	A
	Pulsed	I _{SP}	A
Channel temperature	T _{ch}	150	°C

< Di >

Repetitive peak reverse voltage	V _{RM}	25	V
Reverse voltage	V _R	20	V
Forward current	I _F	0.7	A
Forward current surge peak	I _{FSM}	3.0	A
Junction temperature	T _j	150	°C

< MOSFET AND Di >

Total power dissipation	P _D	1.0	W/TOTAL/MOUNTED ON A CERAMIC BOARD
Range of storage temperature	T _{STG}	-55 to 150	°C

Transistor

●Electrical characteristics (Ta=25°C)

<MOSFET>

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	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-starte resistance	R _{DSS (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
Rise time	t _r *	—	8	—	ns	
Turn-off delay time	t _{d (off)} *	—	25	—	ns	R _L =30Ω R _G =10Ω
Fall time	t _f *	—	10	—	ns	
Total gate charge	Q _g	—	2.1	—	nC	V _{DD} =—15V V _{GS} =—5V
Gate-source charge	Q _{gs}	—	0.5	—	nC	I _D =—1A R _L =15Ω
Gate-drain charge	Q _{gd}	—	0.5	—	nC	R _G =10Ω

* Pulsed

<MOSFET>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V _{SD}	—	—	—1.2	V	I _S =—0.4A, V _{GS} =0V
<Di>						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage drop	V _F	—	—	0.49	V	I _F =0.7A
Reverse leakage	I _R	—	—	200	μA	V _R =20V

Transistor

●Electrical characteristic curves

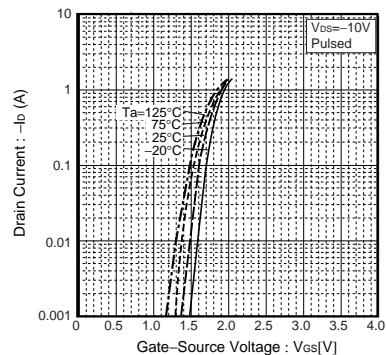


Fig.1 Typical Transfer Characteristics

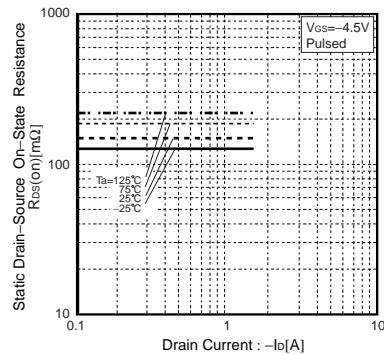


Fig.2 Static Drain-Source On-State Resistance vs. Drain Current

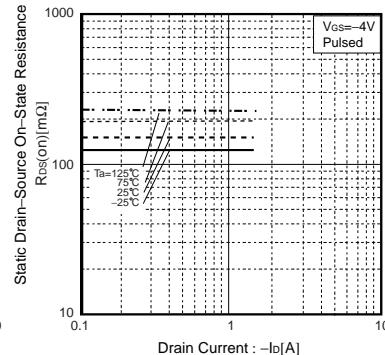


Fig.3 Static Drain-Source On-State Resistance vs. Drain Current

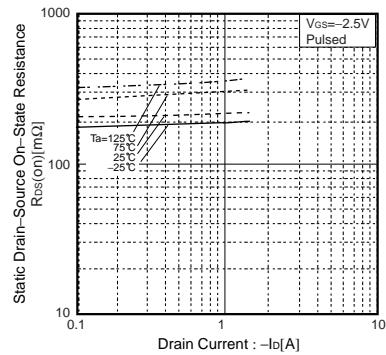


Fig.4 Static Drain-Source On-State Resistance vs. Drain-Current

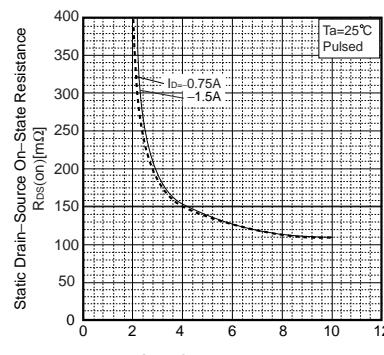


Fig.5 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

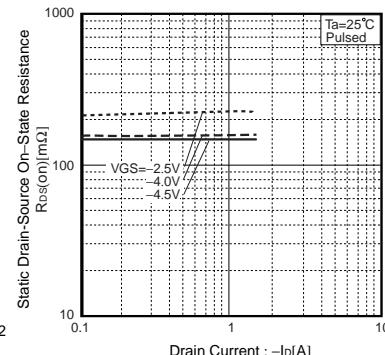


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

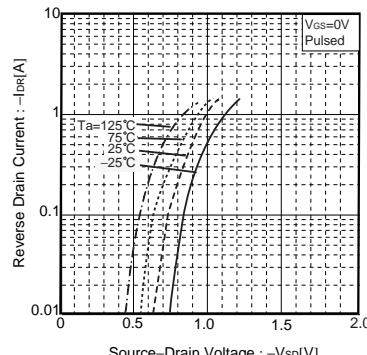


Fig.7 Reverse Drain Current vs. Source-Drain Current

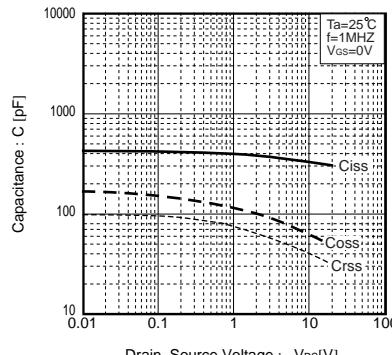


Fig.8 Typical Capacitance vs. Drain-Source Voltage

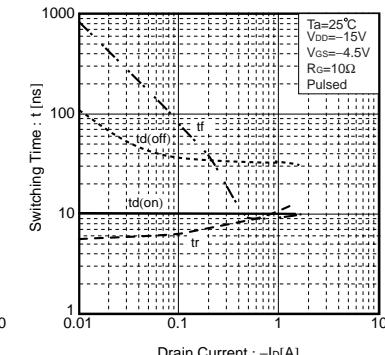
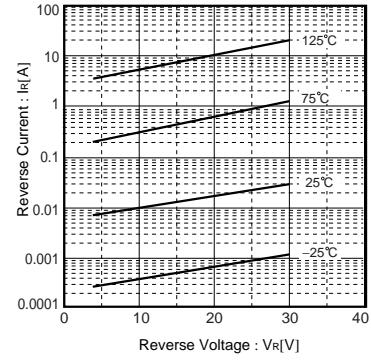
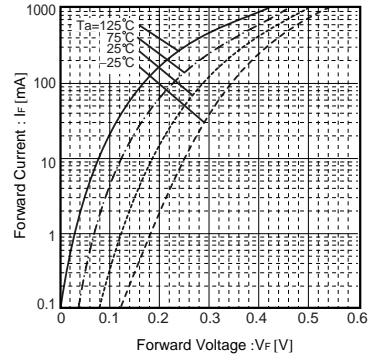
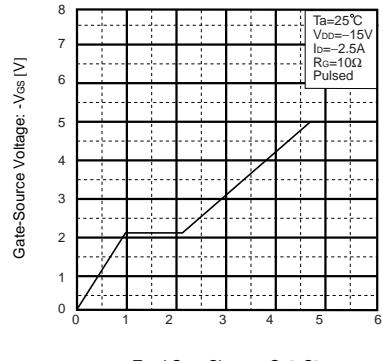


Fig.9 Switching Characteristics

Transistor



●Measurement circuits

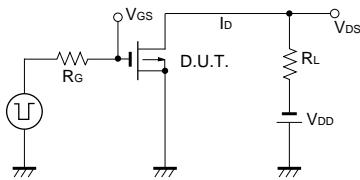


Fig.13 Switching Time Measurement Circuit

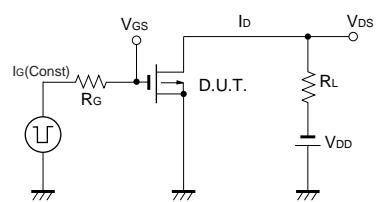
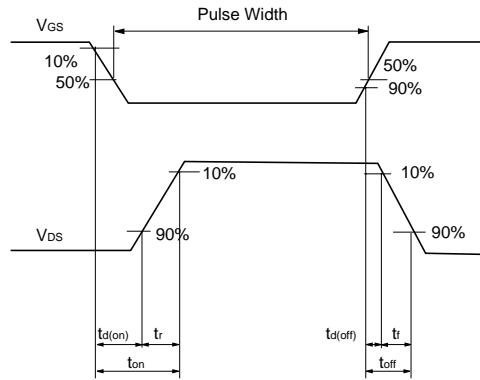
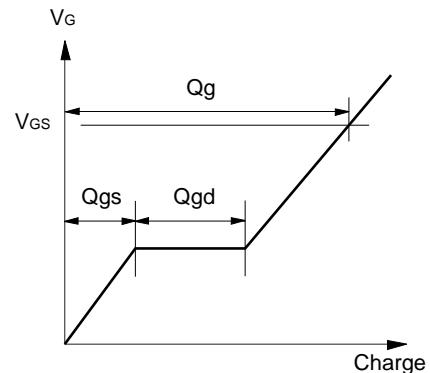


Fig.15 Gate Charge Measurement Circuit



Appendix

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