

F5043

FUJI Intelligent Power MOSFET

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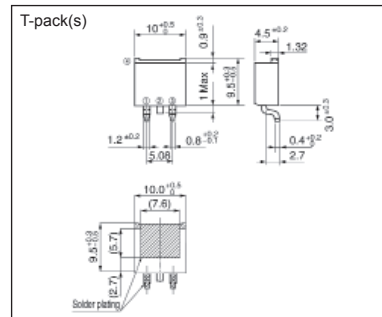
■ Features

- Over temperature protection
- Short circuit protection
- Low on-resistance
- High speed switching

■ Applications

- Solenoid driver
- Lamp driver
- Replacements for fuse and relay

■ Outline drawings [mm]



■ Connection



■ Maximum ratings and characteristics

● Absolute maximum ratings (at Tc=25°C, unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-source voltage	V _{DS}	40	V	DC
Gate-source voltage	V _{GS}	-0.3~7.0	V	DC
Continuous drain current	I _D	12	A	—
Maximum power dissipation	P _D	30	W	—
Operating junction temperature	T _J	150	°C	—
Storage temperature range	T _{stg}	-55 ~ 150	°C	—
Single pulse inductive load switch-off energy dissipation	E _{CL}	100	mJ	T _J =150°C, L=5mH, I ₀ =8A Single pulse, dv/dt≤10V/μs

● Electrical characteristics (at Tc=25°C unless otherwise specified)

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-source clamp voltage	V _{DS}	I _D =1mA, V _{GS} =0V	40	—	60	V
Gate threshold voltage	V _{GS(th)}	I _D =10mA, V _{DS} =13V	1.0	—	2.8	V
Operation gate voltage (protection circuit operates)	V _{GS(p)}	—	3.0	—	7.0	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =13V, V _{GS} =0V	—	—	100	μA
		V _{DS} =30V, V _{GS} =0V	—	—	1	mA
Gate-source leakage current	I _{GS(m)} ** I _{GS(um)} ***	V _{GS} =5V	—	—	500	μA
			—	—	800	μA
Drain-source on-state resistance	R _{DS(on)}	I _D =5A, V _{GS} =5V	—	—	140	mΩ
Turn-on time	t _{on}	V _{DS} =13V, I _D =5A, V _{GS} =5V	—	—	50	μs
Turn-off time	t _{off}		—	—	50	μs
Over-temperature protection	T _{trip}	V _{GS} =5V	150	—	—	°C
Short circuit protection	I _{OC}	V _{GS} =5V	12	—	—	A

Note **: Under normal operation

Note ***: Under self protection

● Electrical characteristics (at Tc=-40~105°C unless otherwise specified)

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-source clamp voltage	V _{DS}	I _D =1mA, V _{GS} =0V	38	—	62	V
Gate threshold voltage	V _{GS(th)}	I _D =10mA, V _{DS} =13V	1.0	—	3.0	V
Operation gate voltage (protection circuit operates)	V _{GS(p)}	—	3.0	—	6.7	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =13V, V _{GS} =0V	—	—	170	μA
		V _{DS} =30V, V _{GS} =0V	—	—	1.6	mA
Gate-source leakage current	I _{GS(m)} * I _{GS(um)} **	V _{GS} =5V	—	—	600	μA
			V _{GS} =5V, T _J >150°C	—	—	940
Drain-source on-state resistance	R _{DS(on)}	I _D =5A, V _{GS} =5V	—	—	205	mΩ
Turn-on time	t _{on}	V _{DS} =13V, I _D =5A, V _{GS} =5V	—	—	62	μs
Turn-off time	t _{off}		—	—	52	μs
Short circuit protection	I _{OC}	V _{GS} =5V	8.4	—	—	A

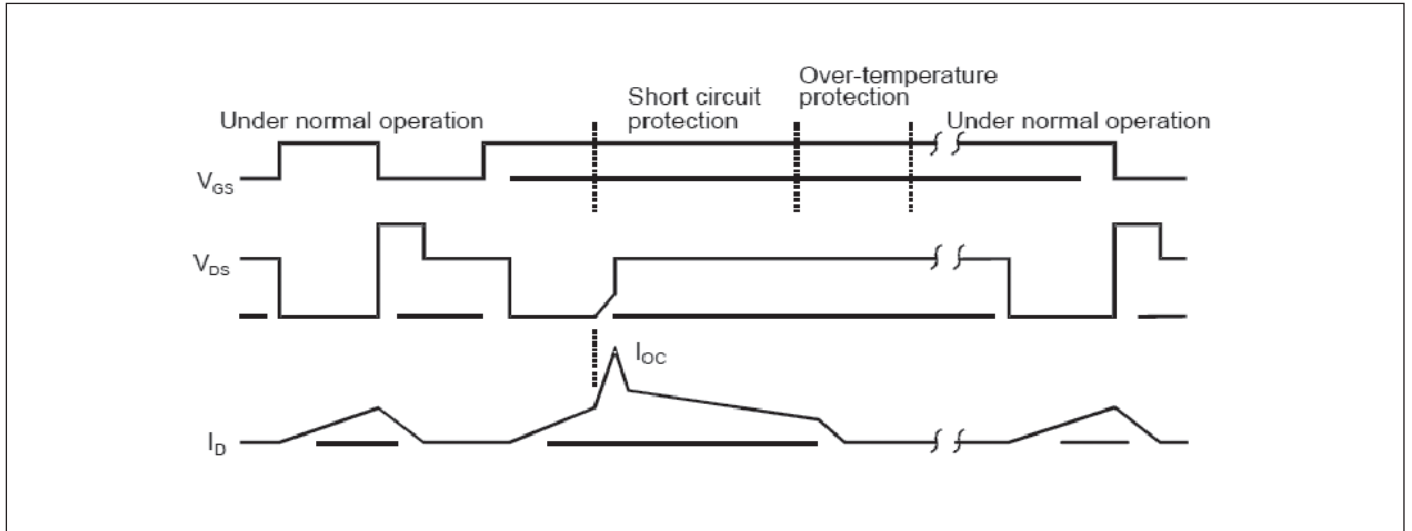
Note *: Under normal operation

Note **: Under self protection (Short circuit ~ Short circuit protection ~ Over-temperature protection)

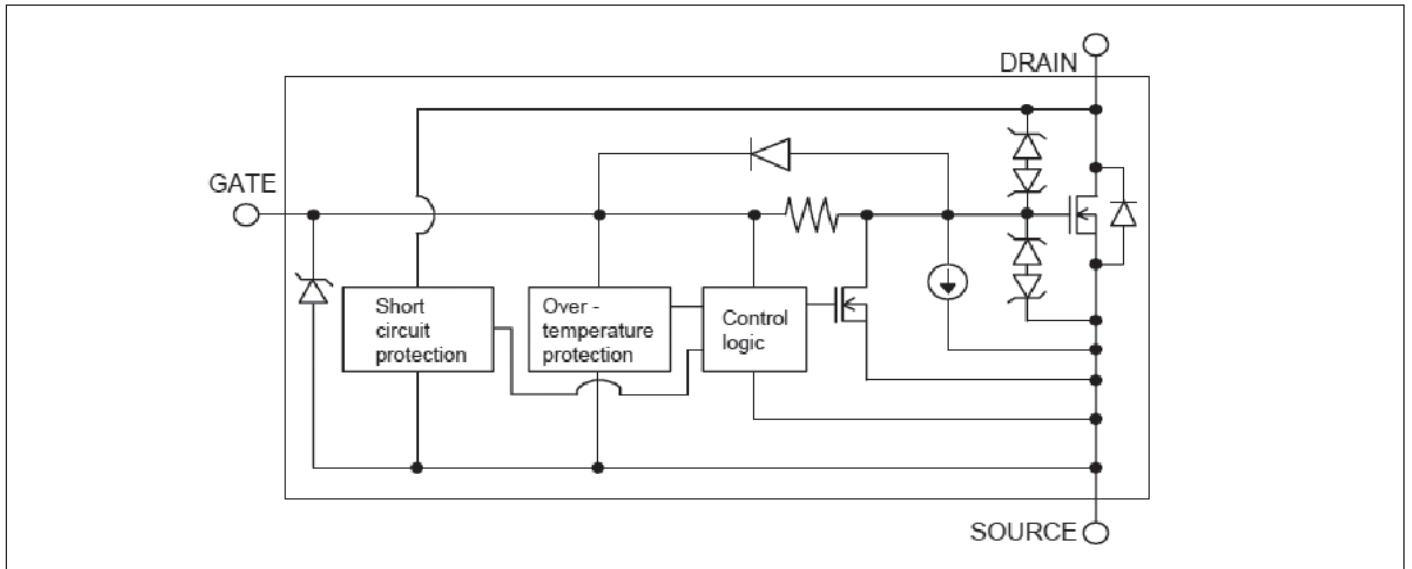
● Thermal resistance

Description	Symbol	Test conditions	min.	typ.	max.	Unit
Thermal resistance	R _{th(j-c)}	Junction-case	—	—	4.2	°C/W
	R _{th(j-a)}	Junction-ambient	—	—	100	°C/W

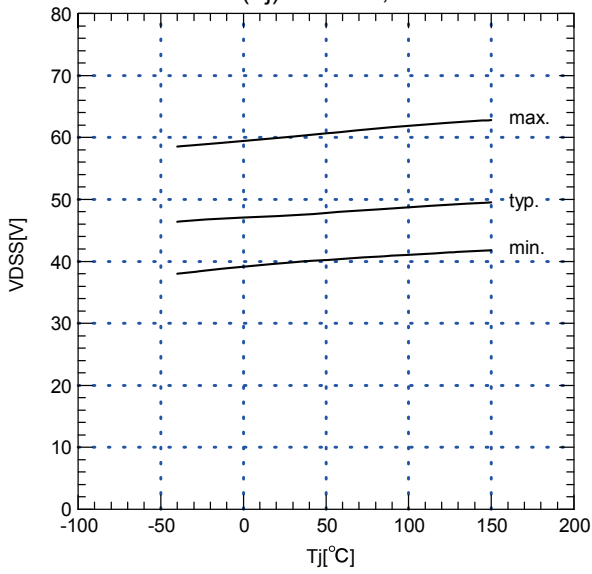
■ Timing chart



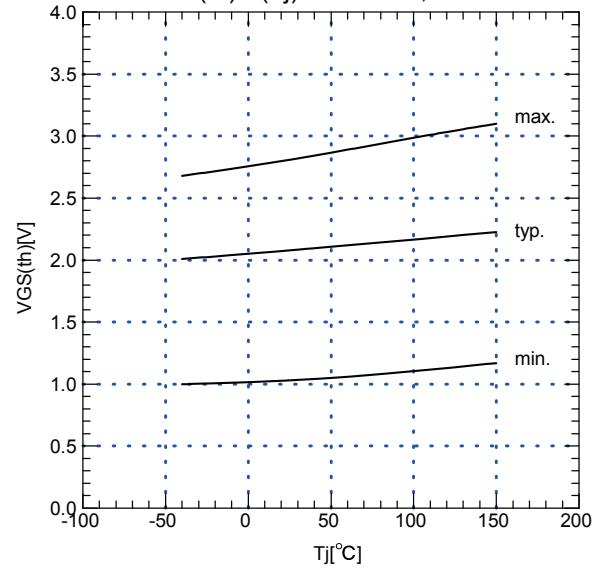
■ Circuit block diagram



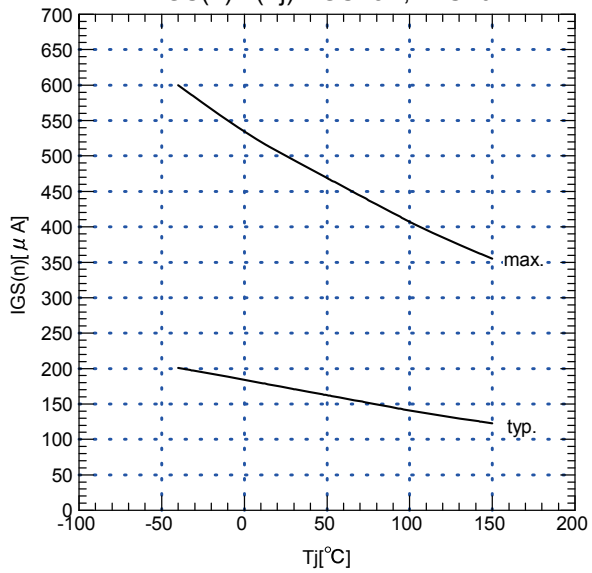
Drain-source clamp voltage
 $V_{DSS}=f(T_j): I_D=1\text{mA}, V_{GS}=0\text{V}$



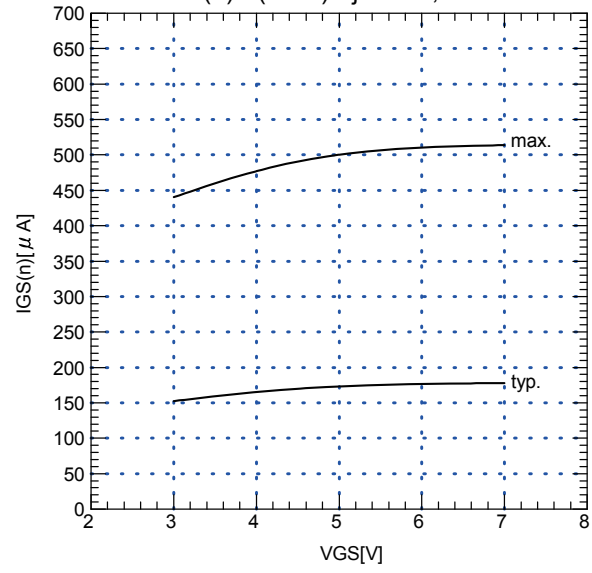
Gate threshold voltage
 $V_{GS(th)}=f(T_j): V_{DS}=13\text{V}, I_D=10\text{mA}$



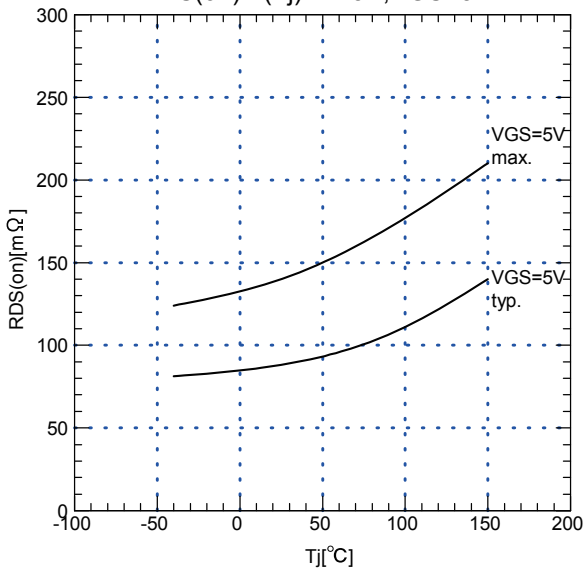
Gate-source leakage current
 $I_{GS(n)}=f(T_j): V_{GS}=5\text{V}, V_{DS}=0\text{V}$



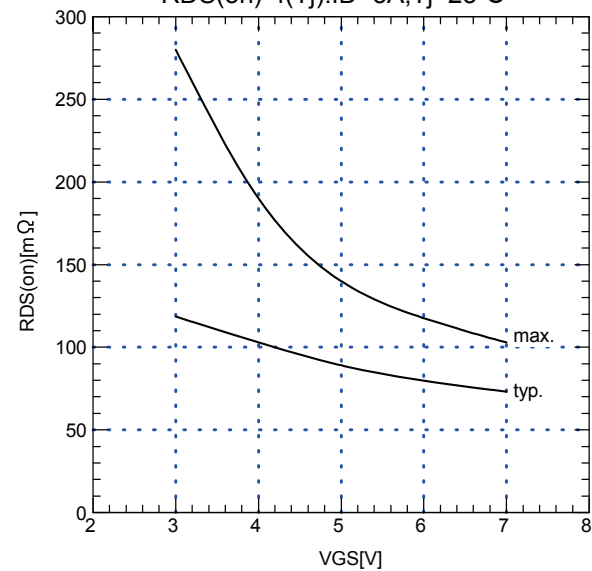
Gate-source leakage current
 $I_{GS(n)}=f(V_{GS}): T_j=25^\circ\text{C}, V_{DS}=0\text{V}$

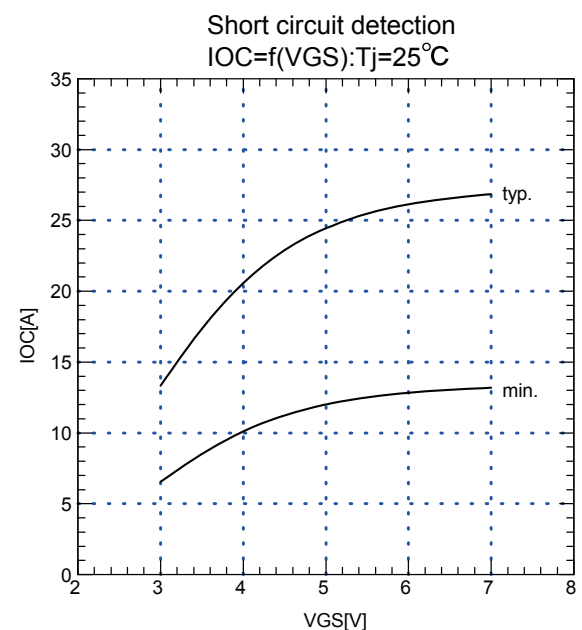
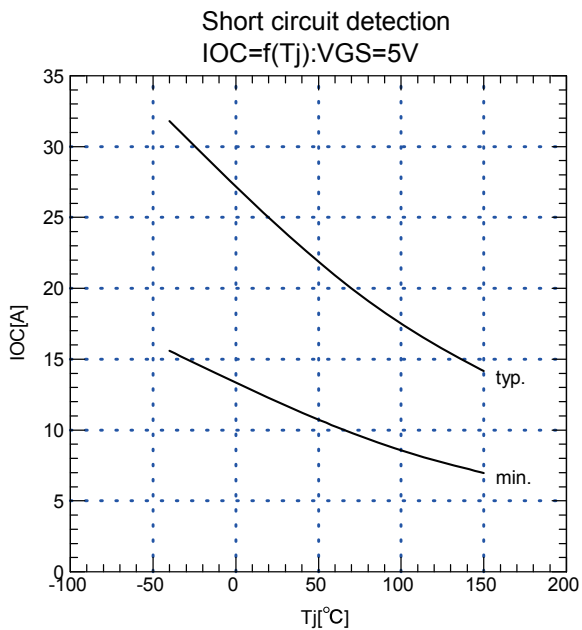
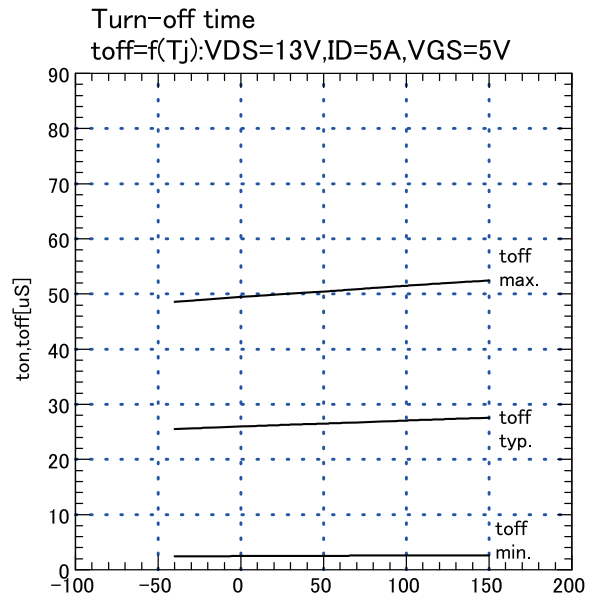
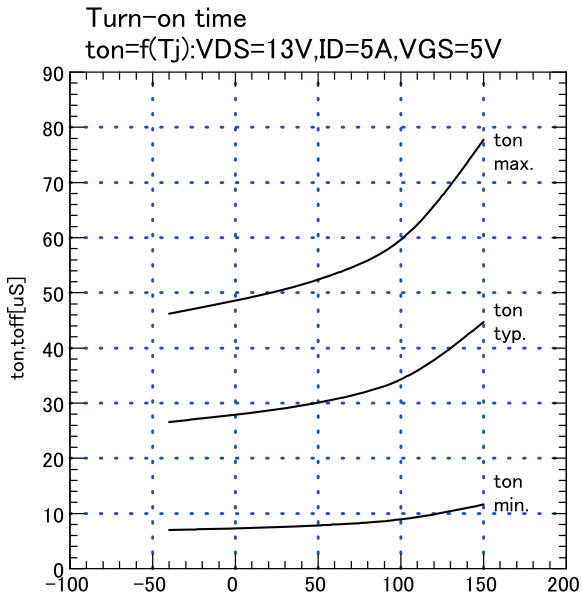
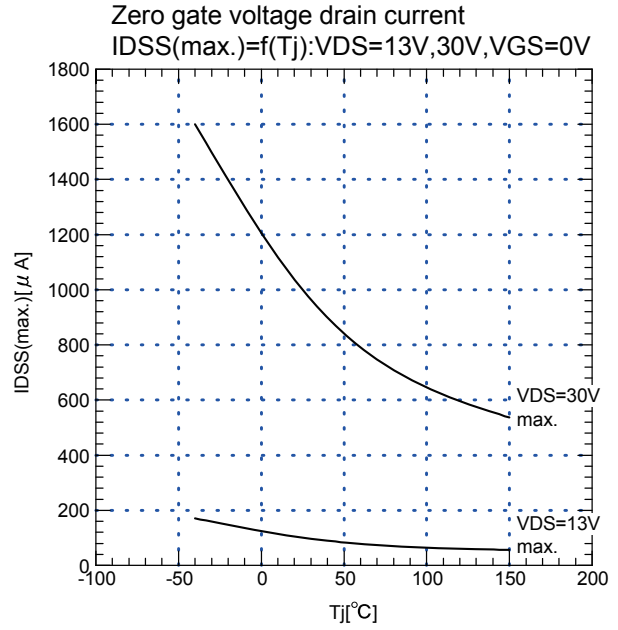
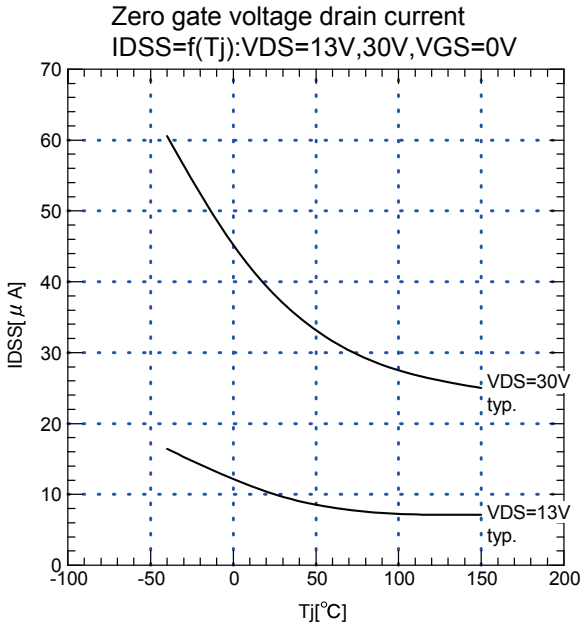


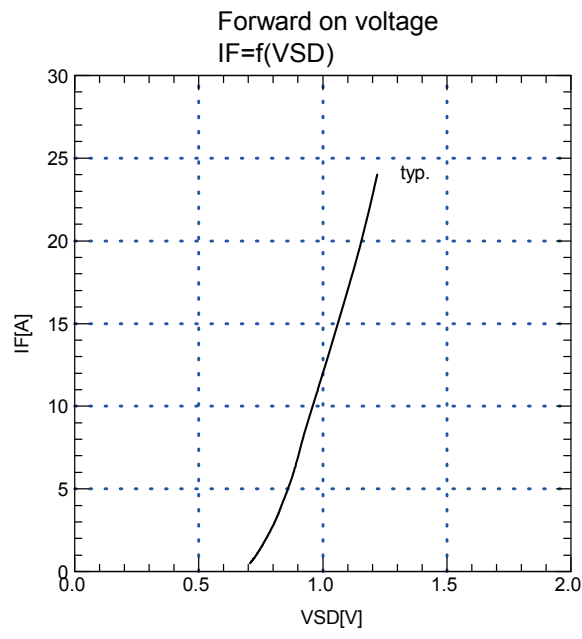
Drain-source on-state resistance
 $R_{DS(on)}=f(T_j): I_D=5\text{A}, V_{GS}=5\text{V}$



Drain-source on-state resistance
 $R_{DS(on)}=f(T_j): I_D=5\text{A}, T_j=25^\circ\text{C}$







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