Elektronische Bauelemente

SID9971

25A, 60V, $R_{DS(ON)}$ 36 mΩ

N-Channel Enhancement Mode Power Mos.FET

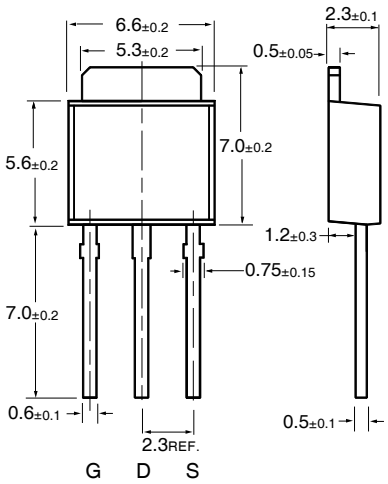
RoHS Compliant Product

Description

The SID9971 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-251 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

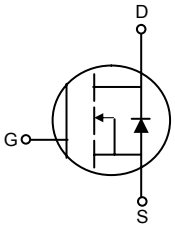
TO-251



Dimensions in millimeters

Features

* Low On-Resistance
* Simple Drive Requirement



Marking Code: 9971

XXXX(Date Code)

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, V_{GS}@10V	I_D@T_C=25°C	25	A
Continuous Drain Current, V_{GS}@10V	I_D@T_C=100°C	16	A
Pulsed Drain Current[1]	I_{DM}	80	A
Total Power Dissipation	P_D@T_C=25°C	39	W
Linear Derating Factor		0.31	W/°C
Operating Junction and Storage Temperature Range	Tj, Tstg	-55~+150	°C

Thermal Data

Parameter		Symbol	Ratings	Unit
Thermal Resistance Junction-case	Max.	Rthj-c	3.2	°C /W
Thermal Resistance Junction-ambient	Max.	Rthj-a	110	°C/W

Electrical Characteristics(Tj=25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	60	–	–	V	V_{GS}=0V, I_D=250uA
Breakdown Voltage Temp. Coefficient	$\triangle BV_{DS}/\triangle Tj$	–	0.05	–	V/°C	Reference to 25°C, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	–	3.0	V	V_{DS}=V_{GS}, I_D=250uA
Gate-Source Leakage Current	I_{GSS}	–	–	±100	nA	V_{GS}=±20V
Drain-Source Leakage Current (Tj=25°C)	I_{DSS}	–	–	1	uA	V_{DS}=60V,V_{GS}=0
Drain-Source Leakage Current(Tj=150°C)		–	–	25	uA	V_{DS}=48V,V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	–	–	36	mΩ	V_{GS}=10V, I_D=18A
		–	–	50		V_{GS}=4.5V, I_D=12A
Total Gate Charge[2]	Qg	–	18	30	nC	I_D=18A V_{DS}=48V V_{GS}= 4.5V
Gate-Source Charge	Qgs	–	6	–		
Gate-Drain ("Miller") Charge	Qgd	–	11	–		
Turn-on Delay Time[2]	$Td_{(ON)}$	–	9	–	nS	V_{DD}=30V I_D=18A V_{GS}=10V R_G=3.3Ω R_D=1.67Ω
Rise Time	Tr	–	24	–		
Turn-off Delay Time	$Td_{(Off)}$	–	26	–		
Fall Time	T_f	–	7	–		
Input Capacitance	Ciss	–	1700	2700	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Output Capacitance	Coss	–	160	–		
Reverse Transfer Capacitance	Crss	–	110	–		
Forward Transconductance	Gfs	–	17	–	S	V_{DS}=10V, I_D=18A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage[2]	V_{SD}	–	–	1.2	V	I_S=25 A, V_{GS}=0V.
Reverse Recovery Time	Trr	–	37	–	nS	I_S=18A, V_{GS}=0V. dI/dt=100A/us
Reverse Recovery Change	Qrr	–	38	–	nC	

Notes: 1.Pulse width limited by safe operating area.
2.Pulse width≦300us, dutycycle≦2%.

Characteristics Curve

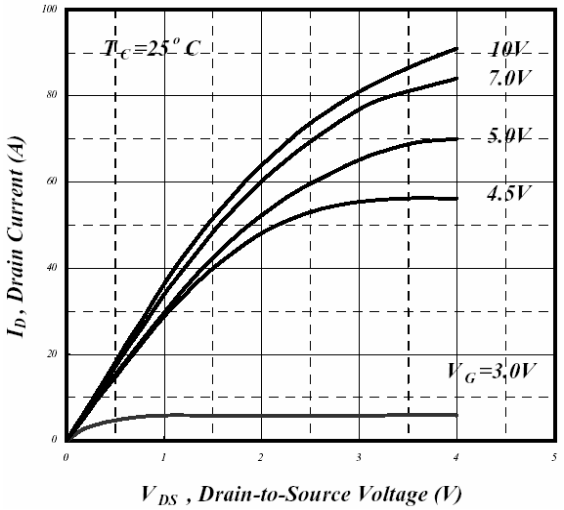


Fig 1. Typical Output Characteristics

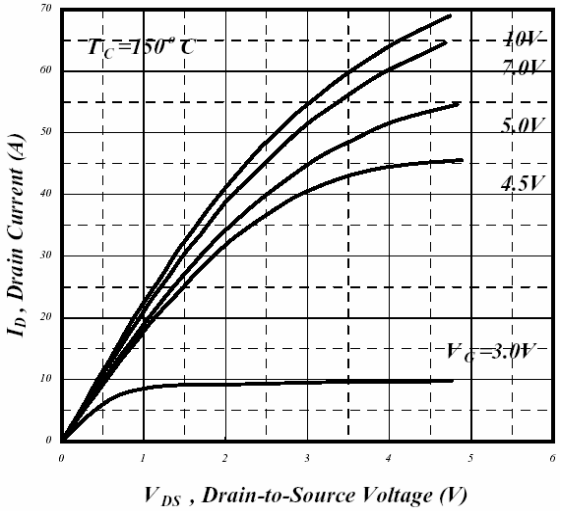


Fig 2. Typical Output Characteristics

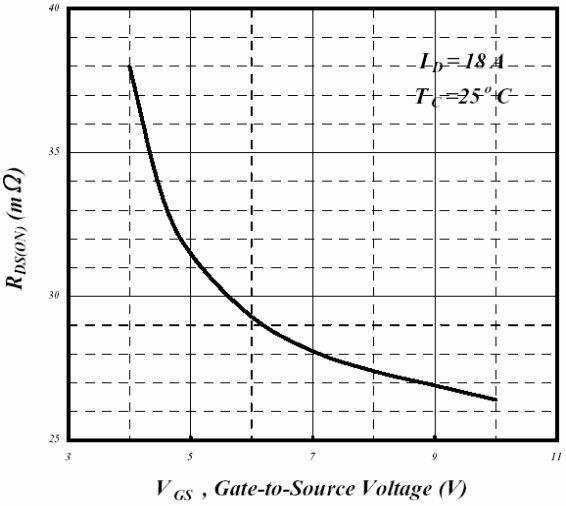


Fig 3. On-Resistance v.s. Gate Voltage

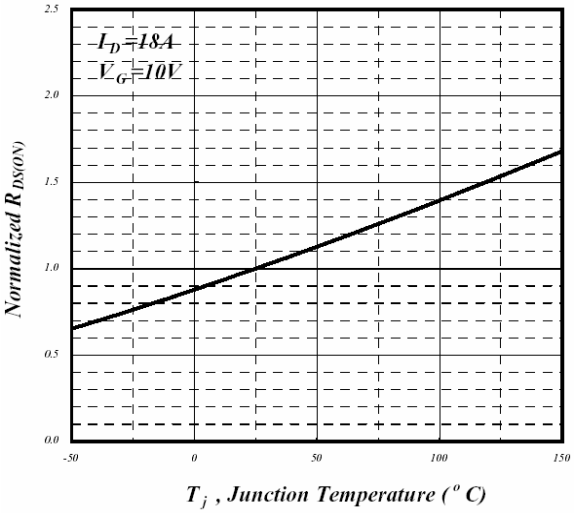


Fig 4. Normalized On-Resistance v.s. Junction Temperature

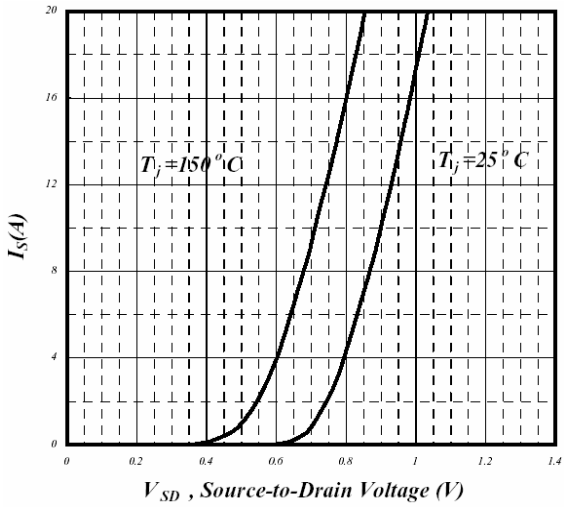


Fig 5. Forward Characteristics of Reverse Diode

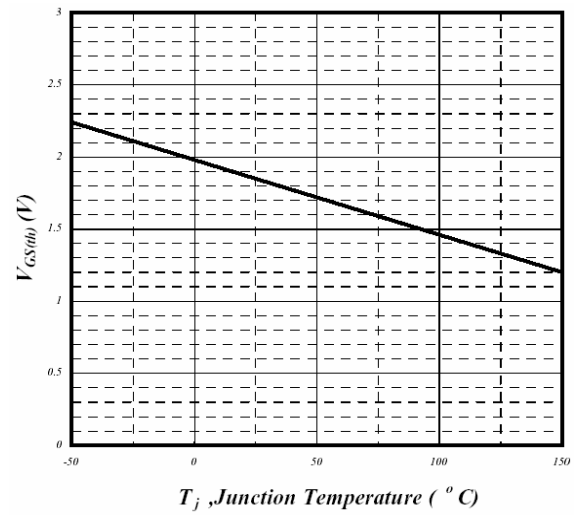


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

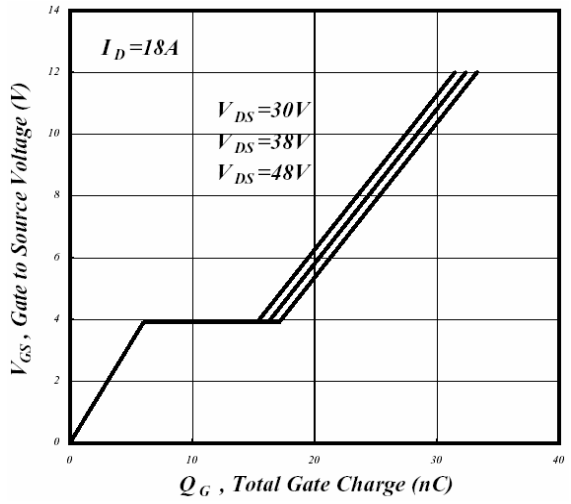


Fig 7. Gate Charge Characteristics

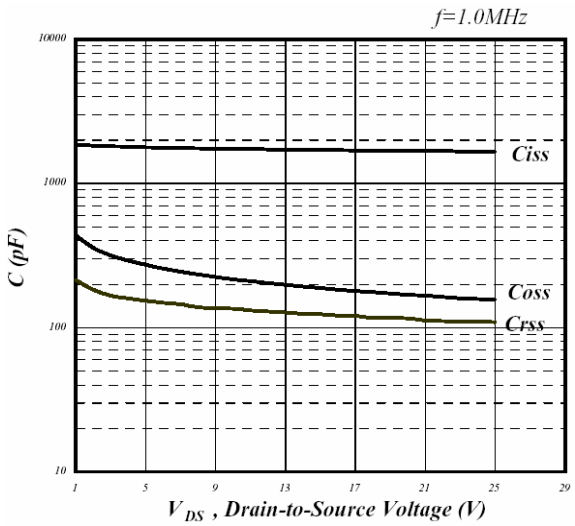


Fig 8. Typical Capacitance Characteristics

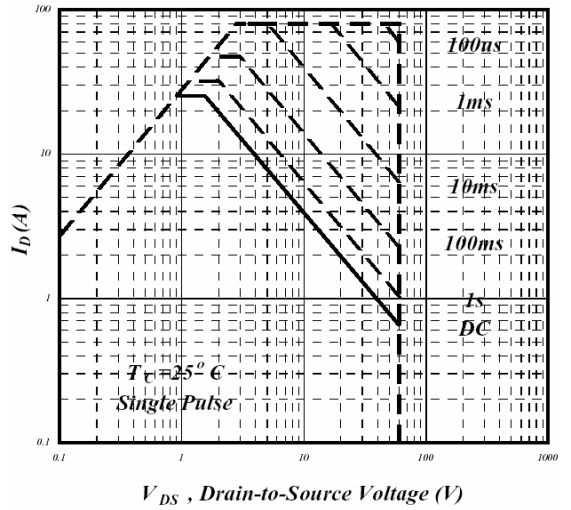


Fig 9. Maximum Safe Operating Area

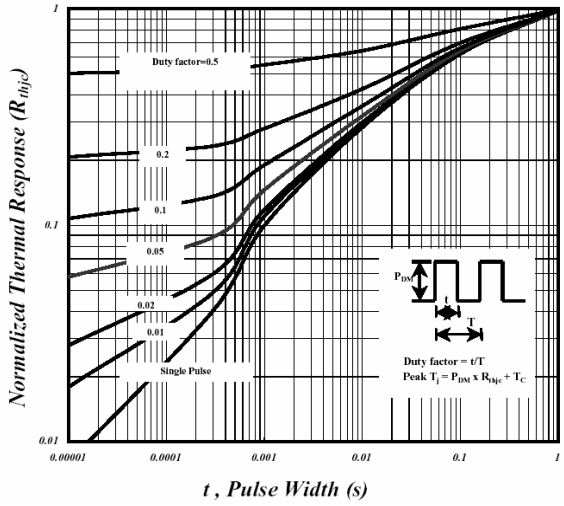


Fig 10. Effective Transient Thermal Impedance

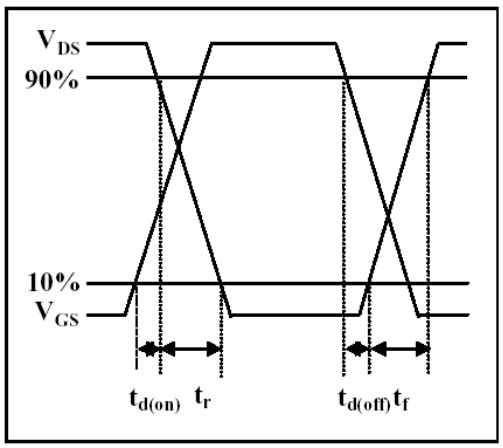


Fig 11. Switching Time Waveform

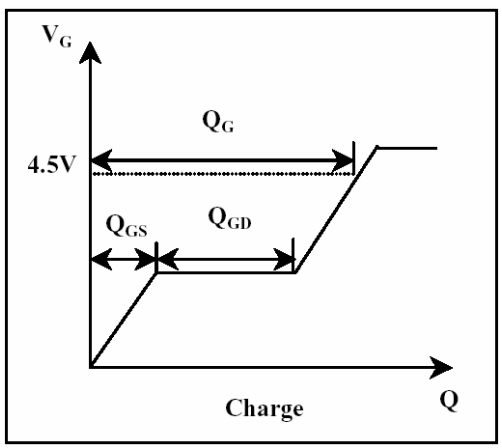


Fig 12. Gate Charge Waveform