Elektronische Bauelemente

SID9971

25A, 60V, $R_{DS(ON)}$ 36mΩ
N-Ch Enhancement Mode Power MOSFET

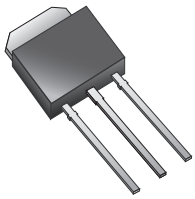
RoHS Compliant Product
A suffix of "-C" specifies halogen free

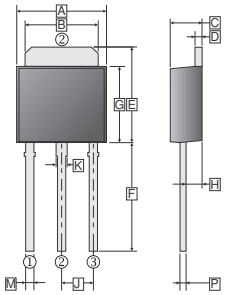
DESCRIPTION

The SID9971 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SID9971 meet the RoHS and Green Product requirement with full function reliability approved.

TO-251



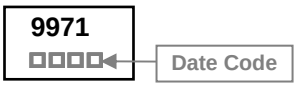


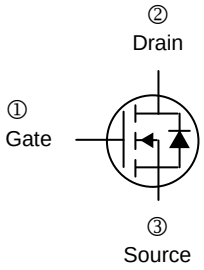
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.35	6.80	G	5.40	6.25
B	4.90	5.50	H	0.85	1.50
C	2.15	2.40	J	2.30 Typ.	
D	0.43	0.90	K	0.60	1.05
E	6.50	7.50	M	0.50	0.90
F	7.20	9.65	P	0.43	0.62

FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available

MARKING





ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current @V_{GS}=10V [1]	T_C=25℃	I_D	25	A
	T_C=100℃		16	
Pulsed Drain Current [2]		I_{DM}	50	A
Total Power Dissipation [1]	T_C=25℃	P_D	39	W
	T_A=25℃		2	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	℃
Thermal Resistance Rating				
Maximum Thermal Resistance from Junction to Ambient [1]		$R_{\theta JA}$	62.5	℃ / W
Maximum Thermal Resistance from Junction to Ambient			110	
Maximum Thermal Resistance from Junction to Case [1]		$R_{\theta JC}$	3.2	

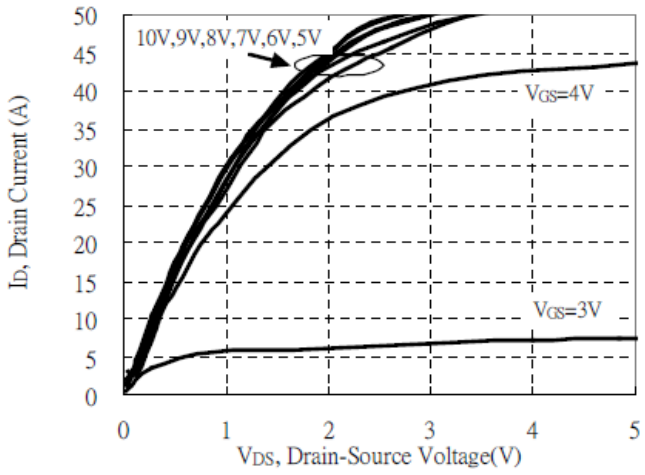
ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	B_{VDSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	V_{DS}=48V, V_{GS}=0V, T_J=25℃
		-	-	25		V_{DS}=48V, V_{GS}=0V, T_J=125℃
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V, V_{DS}= 0V
Forward Transfer conductance	gfs	-	10	-	S	V_{DS}=10V, I_D=18A
Static Drain-Source On-Resistance [3]	$R_{DS(ON)}$	-	27	36	mΩ	V_{GS}=10V, I_D=18A
		-	31	45		V_{GS}=4.5V, I_D=12A
Total Gate Charge @V_{GS}=4.5V	Q_g	-	12.5	-	nC	V_{DS}=48V V_{GS}=10V I_D=18A
Total Gate Charge	Q_g	-	18	-		
Gate-Source Charge	Q_{gs}	-	5	-		
Gate-Drain (“Miller”) Charge	Q_{gd}	-	6	-		
Turn-on Delay Time	$T_{d(on)}$	-	7	-	nS	V_{DD}=30V I_D=18A V_{GS}=10V R_G=3.3Ω R_L=1.67Ω
Turn-on Rise Time	T_r	-	9	-		
Turn-off Delay Time	$T_{d(off)}$	-	23	-		
Turn-off Fall Time	T_f	-	6	-		
Input Capacitance	C_{iss}	-	1572	-	pF	V_{DS}=30V V_{GS}=0V f=1MHz
Output Capacitance	C_{oss}	-	58	-		
Reverse Transfer Capacitance	C_{rss}	-	39	-		
Source-Drain Diode						
Diode Forward Voltage [3]	V_{SD}	-	-	1.2	V	I_S=25A, V_{GS}=0
Continuous Source Current [1]	I_S	-	-	25	A	
Pulsed Source Current [2]	I_{SM}	-	-	50		
Reverse Recovery Time	T_{rr}	-	37	-	nS	I_S=18A, dI/dt=100A/μs T_J=25℃
Reverse Recovery Charge	Q_{rr}	-	38	-	nC	

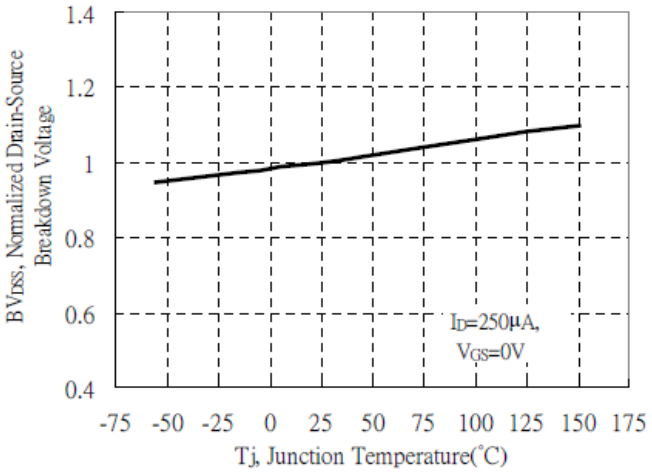
Notes:
1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The power dissipation is limited by 150℃ junc tion temperature
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

CHARACTERISTIC CURVES

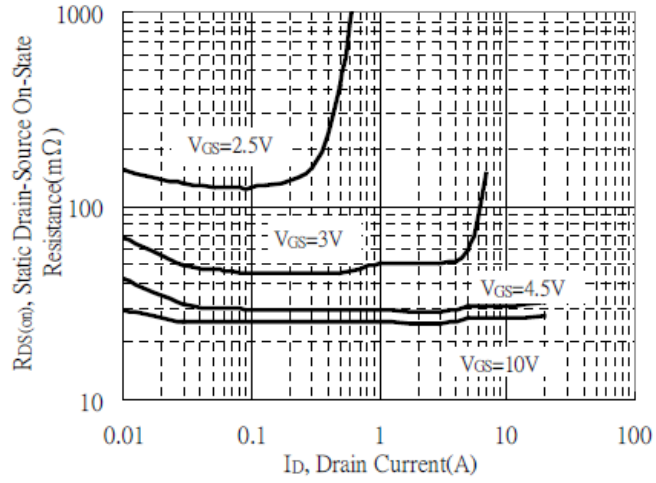
Typical Output Characteristics



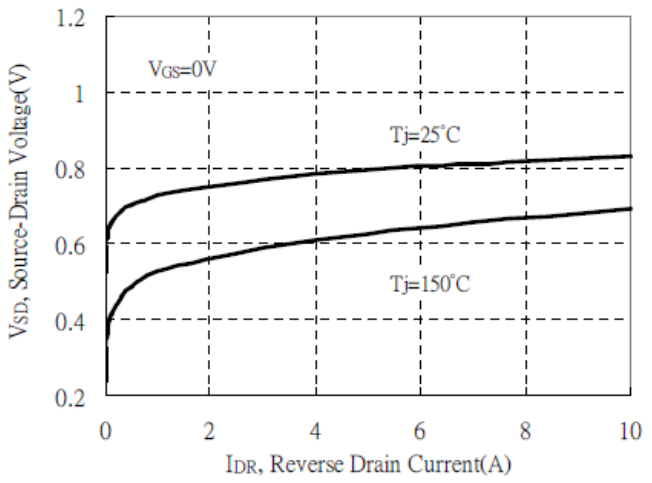
Brekdown Voltage vs Ambient Temperature



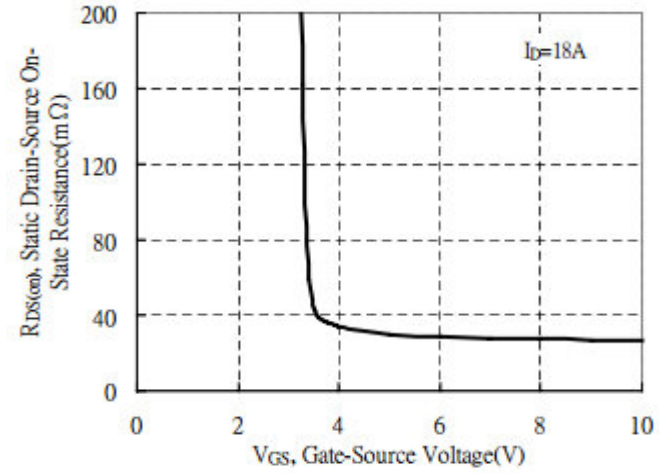
Static Drain-Source On-State resistance vs Drain Current



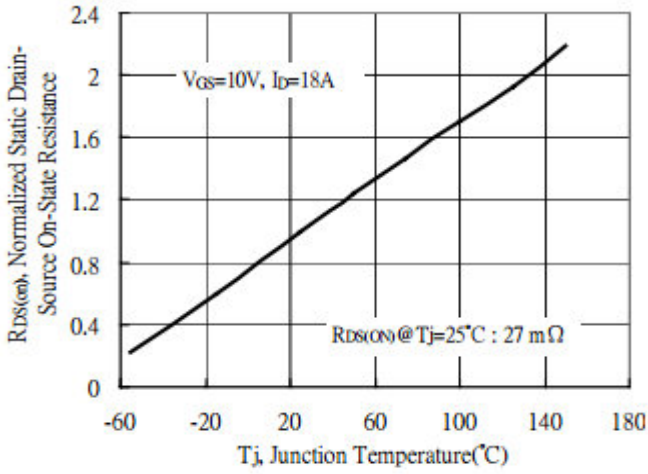
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

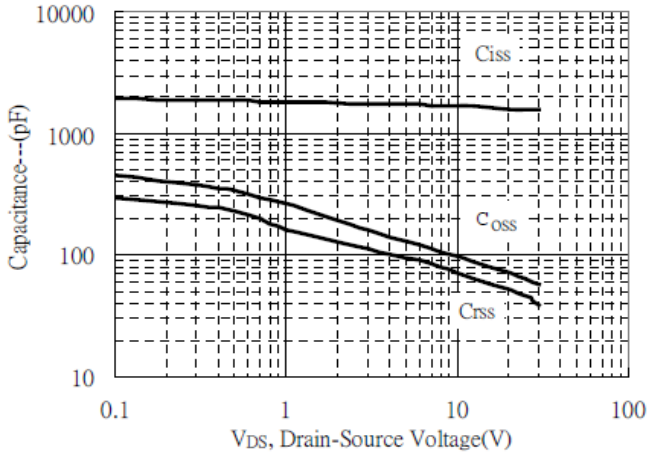


Drain-Source On-State Resistance vs Junction Tempearture

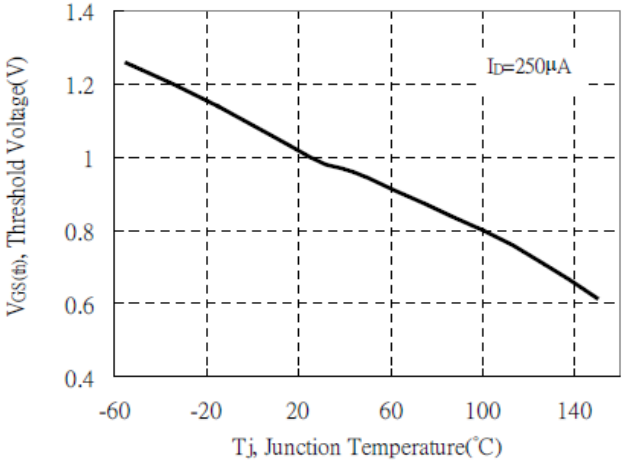


CHARACTERISTIC CURVES

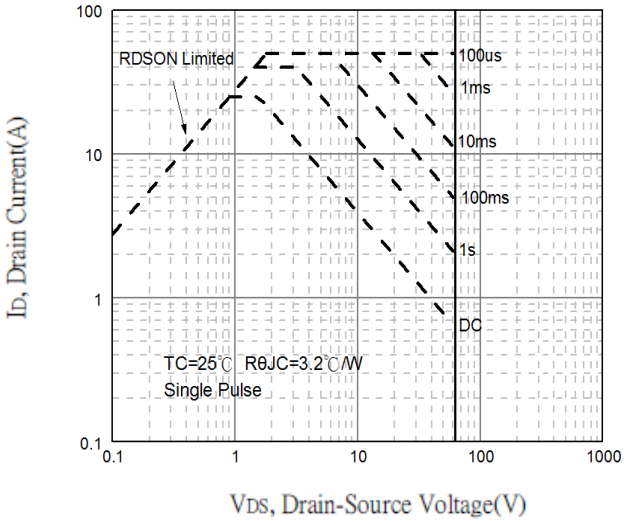
Capacitance vs Drain-to-Source Voltage



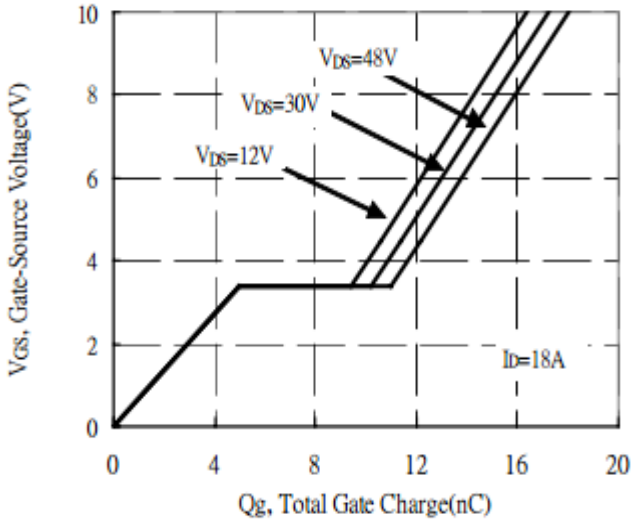
Threshold Voltage vs Junction Tempearture



Maximum Safe Operating Area



Gate Charge Characteristics



Transient Thermal Response Curves