

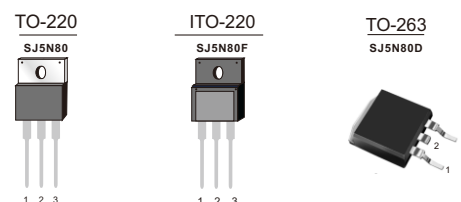
FEATURES

- $R_{DS(ON)} < 1.5\Omega @ V_{GS}=10V$
- 100% avalanche tested
- RoHS compliant

Product Summary			
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (A)	Q_g (Typ)
800V	1.3 @ 10V	5	15nc

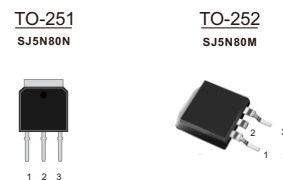
MECHANICAL DATA

- Case: TO-220, ITO-220, TO-251, TO-252, TO-263 package



Ordering Information

Part No.	Package Type	Package	Quality(box)
SJ5N80	TO-220	Tube	1000
SJ5N80F	ITO-220	Tube	1000
SJ5N80D	TO-263	Tape & Reel	800
SJ5N80M	TO-252	Tape & Reel	3000
SJ5N80N	TO-251	Tube	1000



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

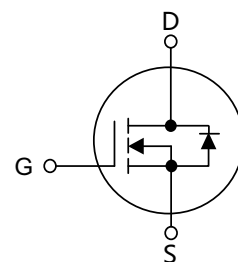


Table1 Absolute Maximum Ratings ($T_c=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	TO-220/TO-263	ITO-220	Unit
		TO-251/TO-252		
Drain-Source Voltage	V_{DS}	800		V
Gate-Source Voltage	V_{GS}	± 30		V
Continuous Drain Current	I_D	$T_c=25^\circ\text{C}$	4.2	A
		$T_c=100^\circ\text{C}$	2.65	
Pulsed Drain Current (Note 1)	I_{DM}	11		A
Single Pulse Avalanche Energy(Note 2)	E_{AS}	46		mJ
Avalanche Current repetitive	I_{AR}	1		A
Repetitive Avalanche Energy, $I_D=1A, V_{DD}=50V$ repetitive	E_{AR}	0.2		mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	15		V/ns
Drain Source voltage slope($V_{DS}=720V$)	dV_{DS}/dt	50		V/ns
Power Dissipation $T_c=25^\circ\text{C}$	P_D	37	26	W
Operating Junction and Storage Temperature	T_J/T_{STG}	-55 ~ +150		$^\circ\text{C}$
Maximum Temperature for soldering	T_L	300		$^\circ\text{C}$

SJ5N80 Series

Table 2. Thermal Characteristics

Parameter	Symbol	TO-220/TO-263 TO-251/TO-252	ITO-220	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62	80	$^{\circ}\text{C}/\text{W}$
Thermal resistance Junction to Case	$R_{\theta JC}$	3.4	5.0	$^{\circ}\text{C}/\text{W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu\text{A}$	800	--	--	V	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=800V, V_{GS}=0V$	--	--	1	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=30V, V_{DS}=0V$	--	--	100	nA
	Reverse					$V_{GS}=-30V, V_{DS}=0V$	--
On Characteristics(Note 4)							
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.5	--	4.5	V	
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2A$	--	1.3	1.5	Ω	
Dynamic Characteristics							
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	--	320	--	pF	
Output Capacitance	C_{OSS}		--	75	--	pF	
Reverse Transfer Capacitance	C_{RSS}		--	5	--	pF	
Switching Characteristics							
Turn-On Delay Time	$t_d(\text{on})$	$V_{DD}=400V, I_D=2A,$ $R_G=20\Omega$	--	10	--	ns	
Turn-On Rise Time	t_r		--	8	--	ns	
Turn-Off Delay Time	$t_d(\text{off})$		--	60	--	ns	
Turn-Off Fall Time	t_f		--	13	--	ns	
Total Gate Charge	Q_G	$V_{DS}=480V, I_D=2A,$ $V_{GS}=10V$	--	15	--	nC	
Gate-Source Charge	Q_{GS}		--	3	--	nC	
Gate-Drain Charge	Q_{GD}		--	6	--	nC	
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage(Note 4)	V_{SD}	$V_{GS}=0V, I_S=2A$	--	0.9	1.5	V	
Maximum Continuous Drain-Source Diode Forward Current	I_S		--	--	4	A	
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_F=2A$ $di_F/dt=100A/\mu\text{s}$	--	180	--	ns	
Reverse Recovery Charge	Q_{RR}		--	1.5	--	μC	

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature

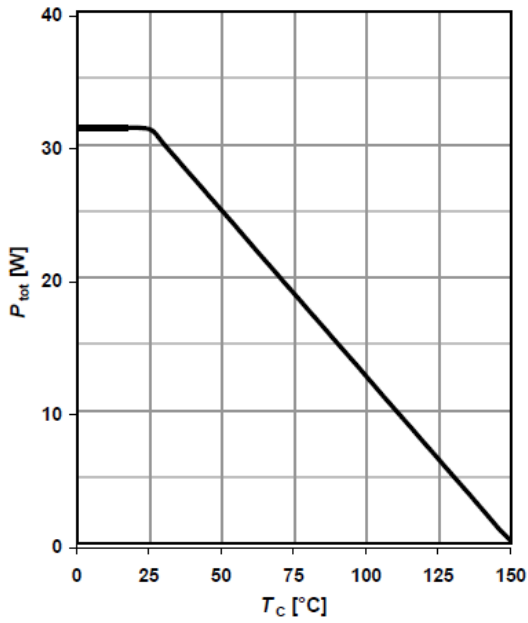
2 $I_{AS}=4A, V_{DD}=150V, L=60\text{mH}$, Starting $T_J=25^{\circ}\text{C}$

3 $I_{SD}\leq I_D, di/dt\leq 200A/\mu\text{s}, V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$

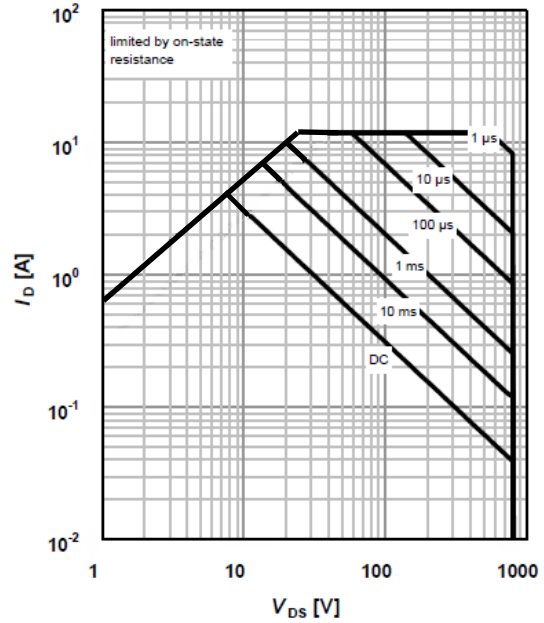
4 Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

Typical characteristics Diagrams

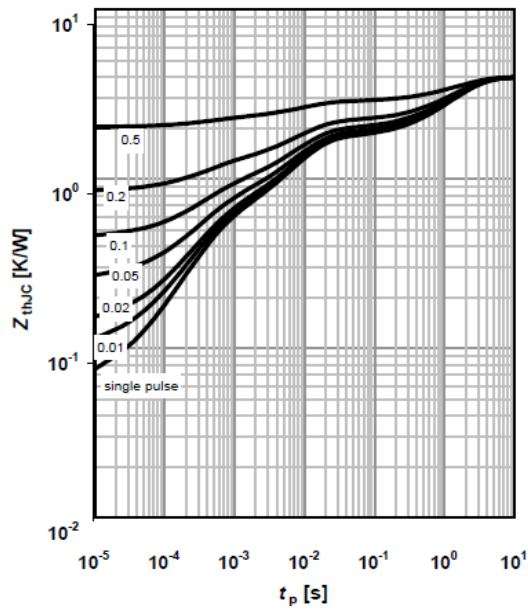
1 Power dissipation



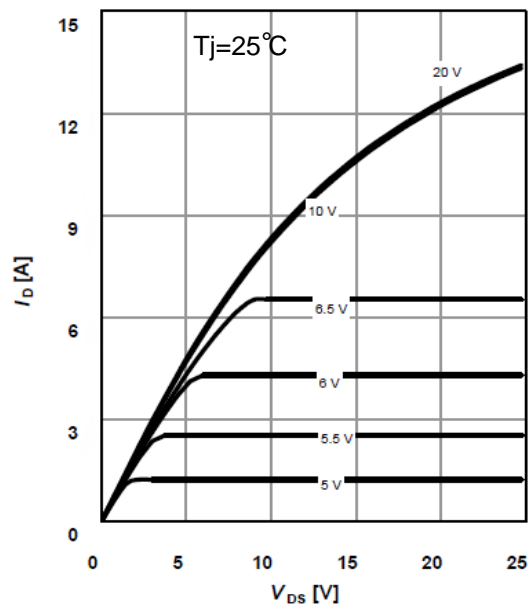
2 Safe operating area



3 Max. transient thermal impedance
TO-220 TO-263
TO-251 TO-252

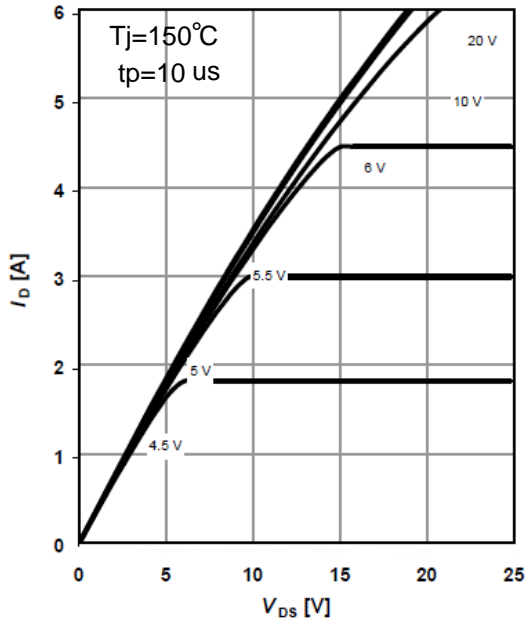


4 Typ. output characteristics

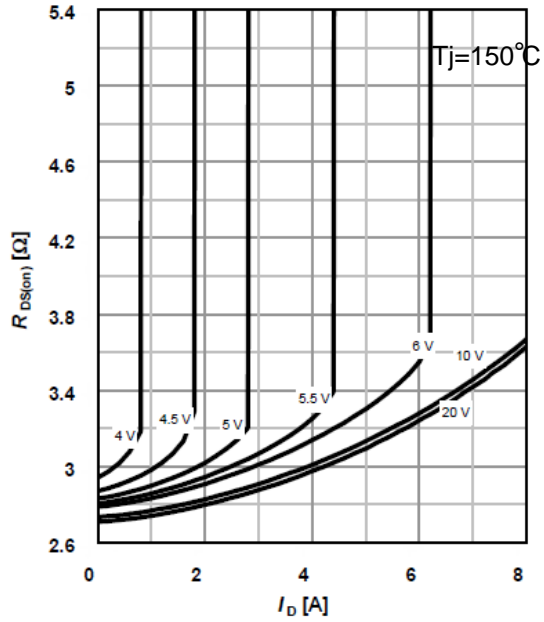


Typical characteristics Diagrams

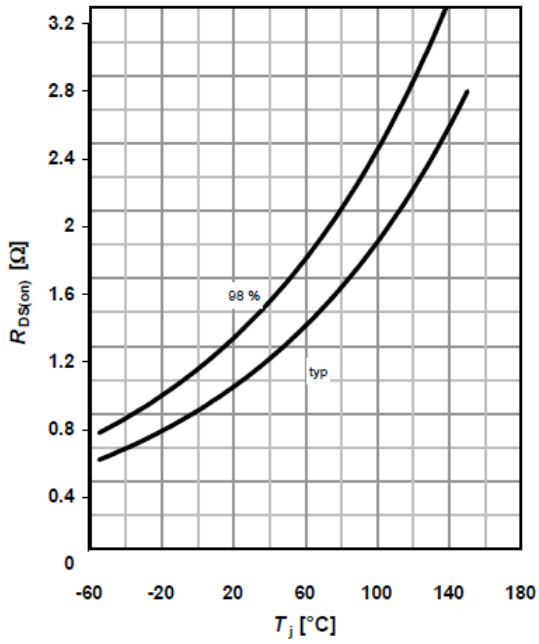
5 Typ.output characteristics



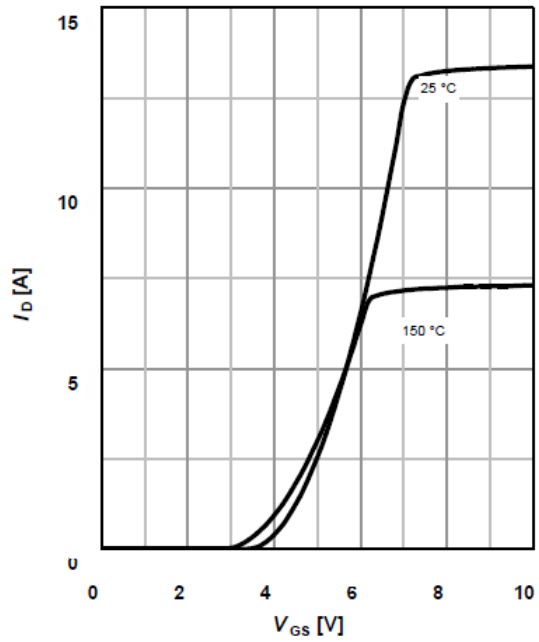
6 Typ.drain-source on-state resistance



7 Drain-source on-state resistance

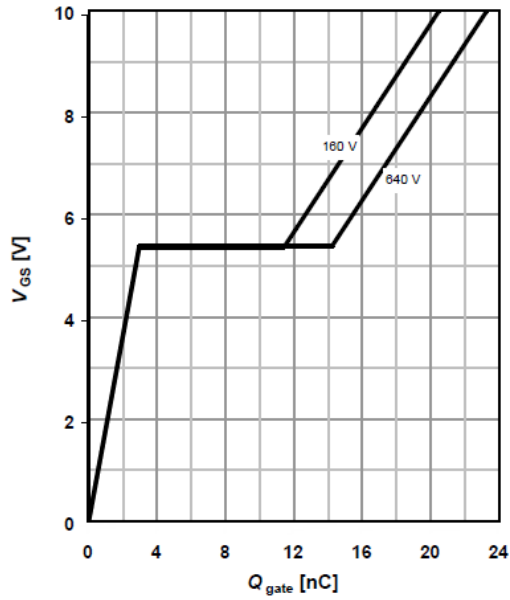


8 Typ.transfer characteristics

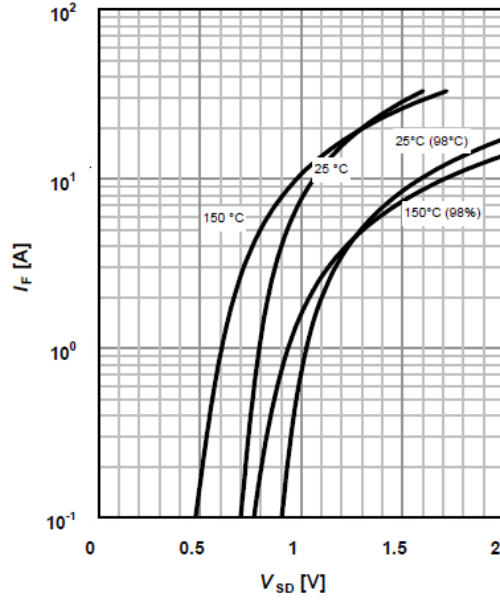


Typical characteristics Diagrams

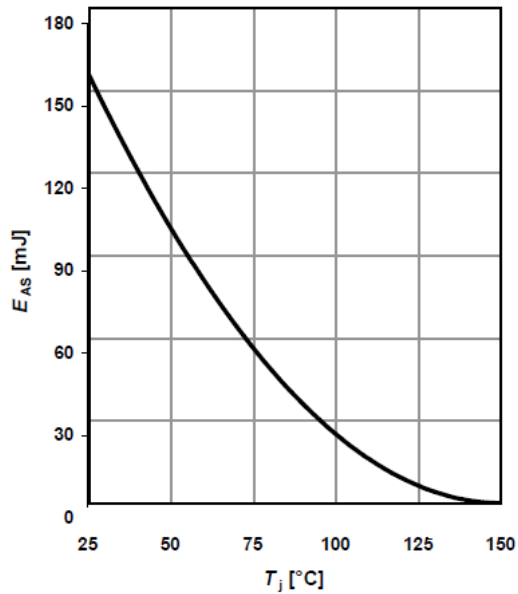
9 Typ.gate charge



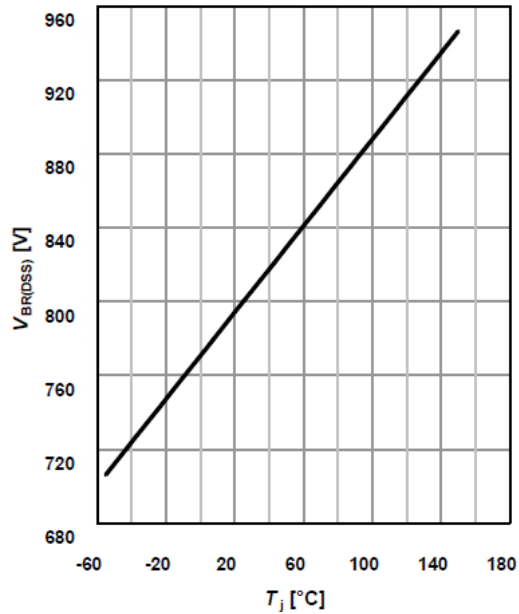
10 Forward characteristics of reverse diode



11 Avalanche energy

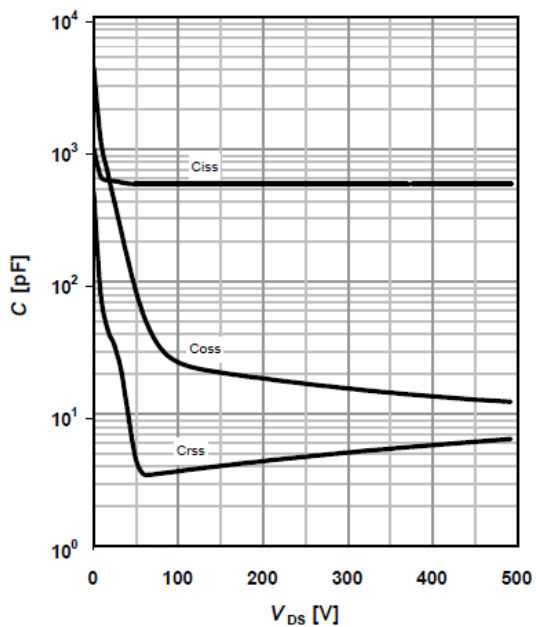


12 Drain-source breakdown voltage

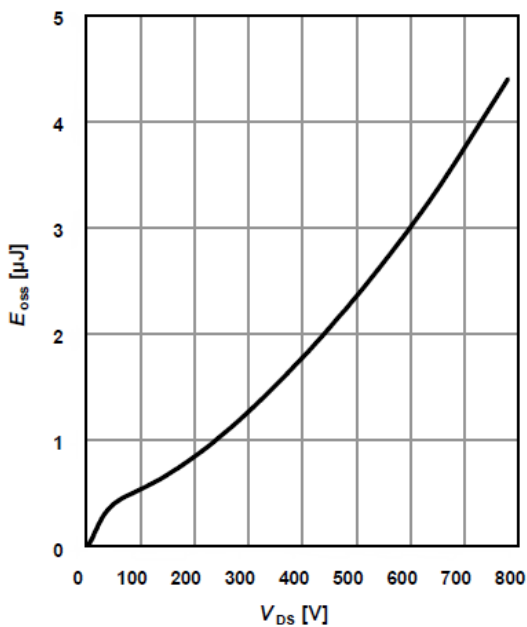


Typical characteristics Diagrams

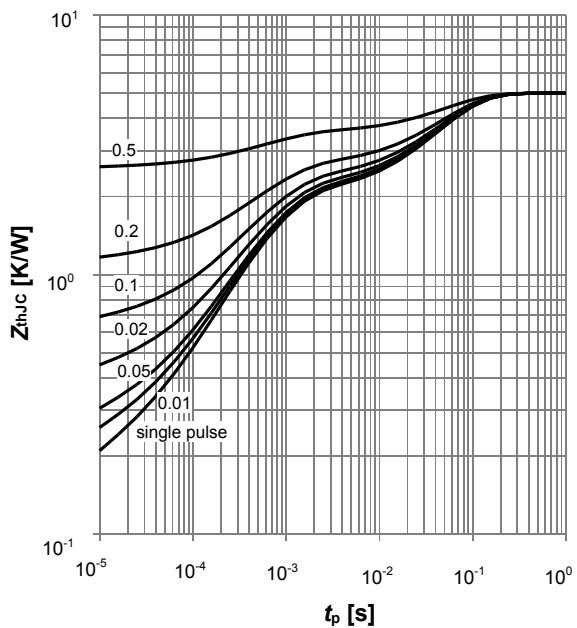
13 Typ.capacitances



14 Typ.Coss stored energy



15 Max.transient thermal impedance
ITO-220



Typical characteristics Diagrams

Table 20 Switching times test circuit and waveform for inductive load

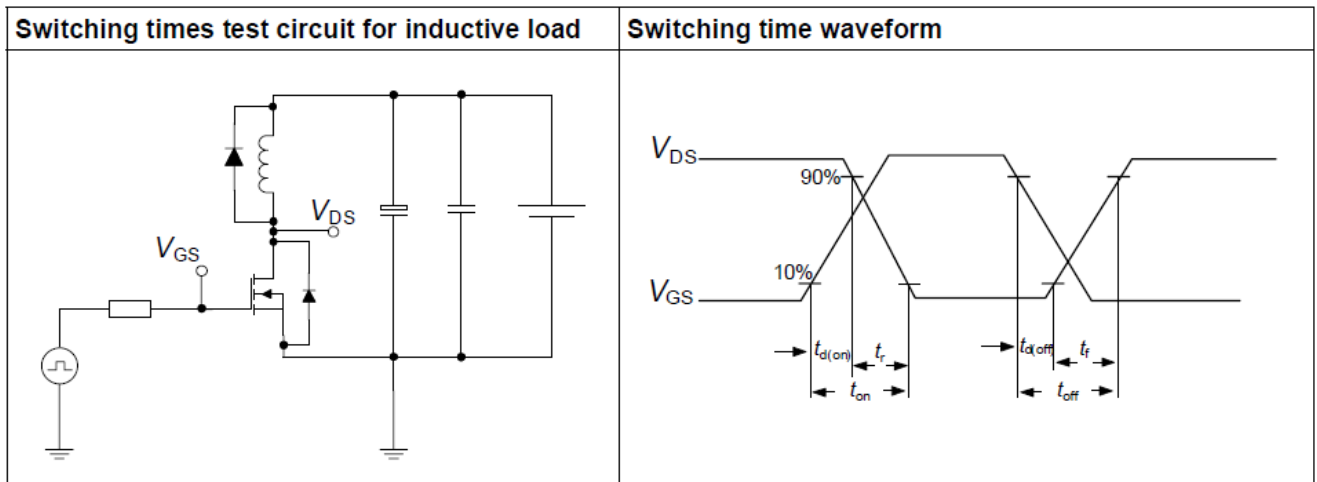


Table 21 Unclamped inductive load test circuit and waveform

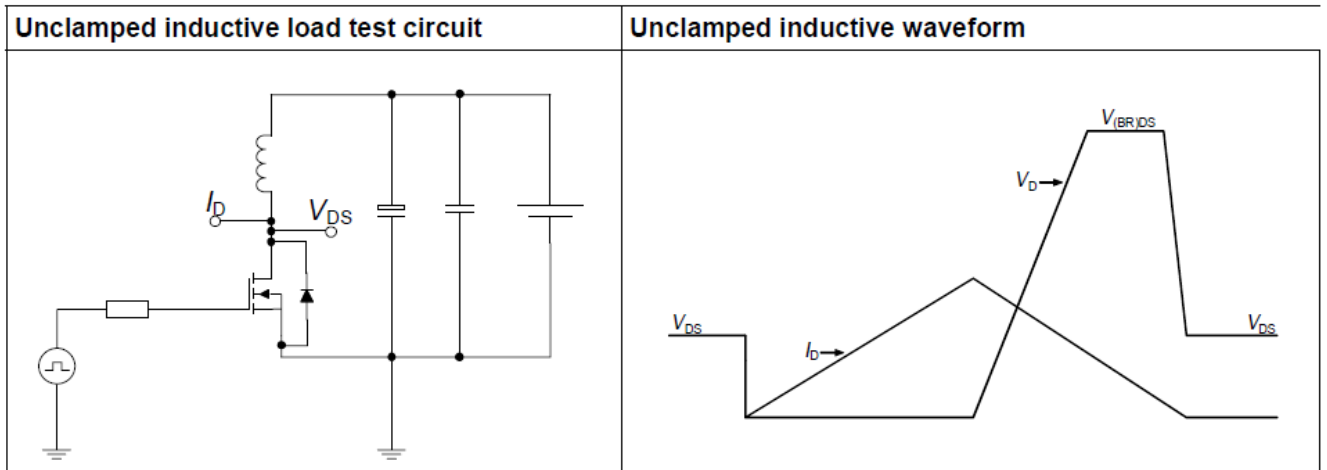
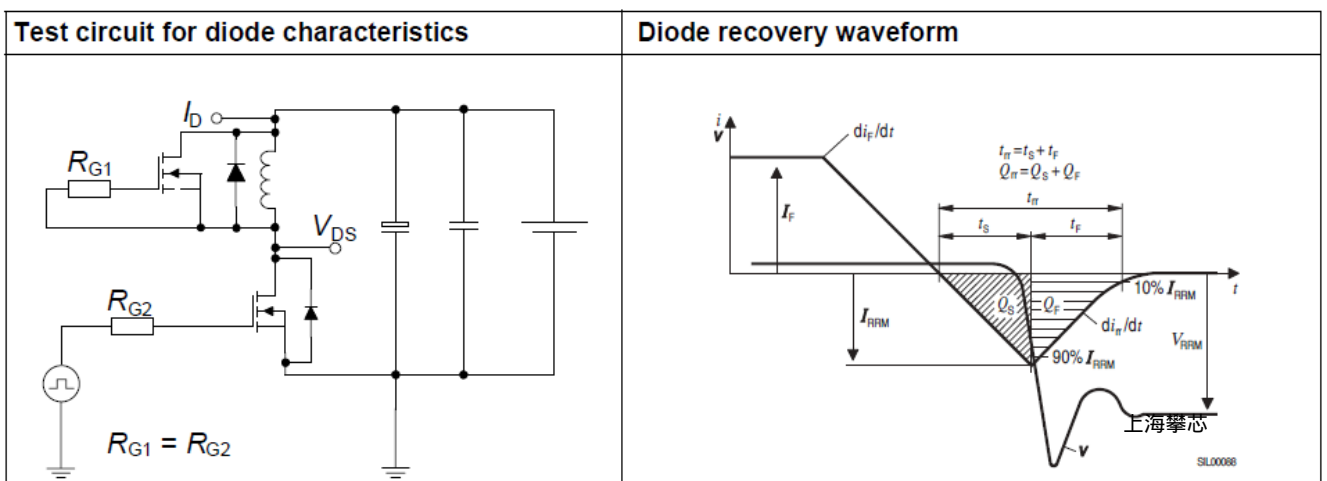
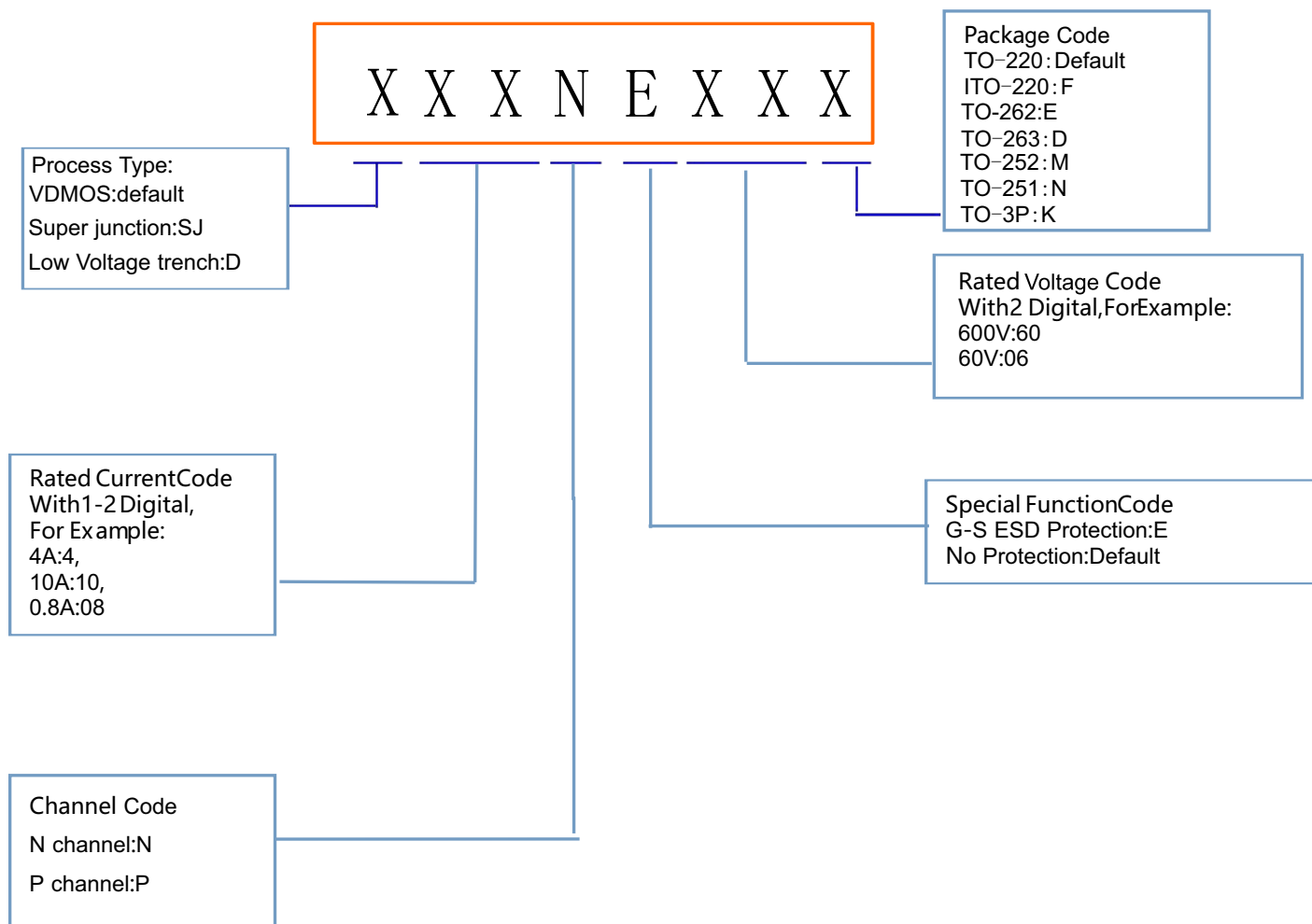


Table 22 Test circuit and waveform for diode characteristics



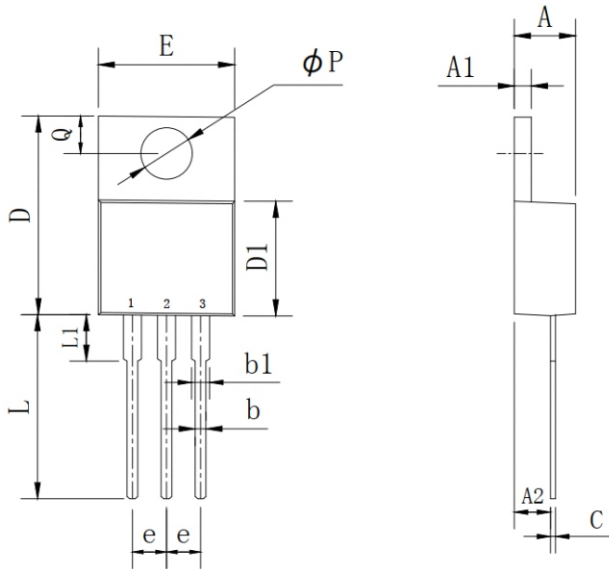
Product Names Rules



SJ5N80 Series

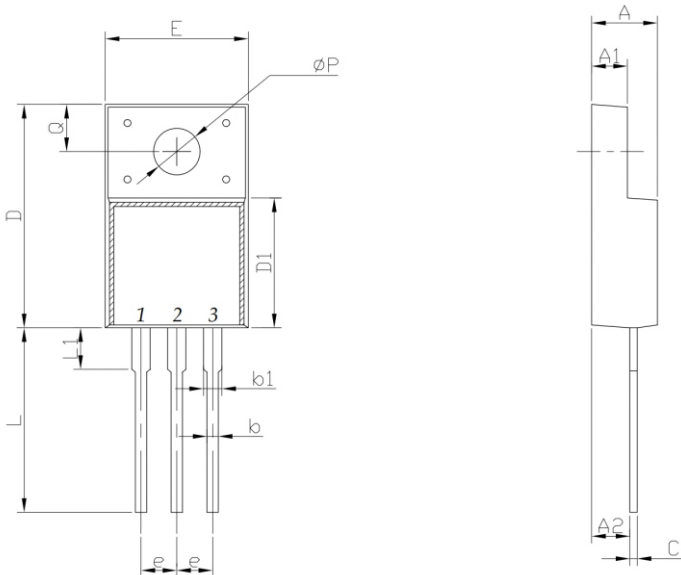
Dimensions

TO-220 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	2.03	2.92	0.080	0.115
b	0.51	1.11	0.020	0.044
b1	0.97	1.6	0.038	0.063
C	0.3	0.7	0.012	0.028
D	14.6	15.9	0.575	0.626
D1	8.04	9.3	0.317	0.366
E	9.57	10.57	0.377	0.416
e	2.34	2.74	0.092	0.108
L	12.58	14.3	0.495	0.563
L1	2.8	4.2	0.110	0.165
P	3.4	4.14	0.134	0.163
Q	2.45	3	0.096	0.118

ITO-220 PACKAGE OUTLINE DIMENSIONS

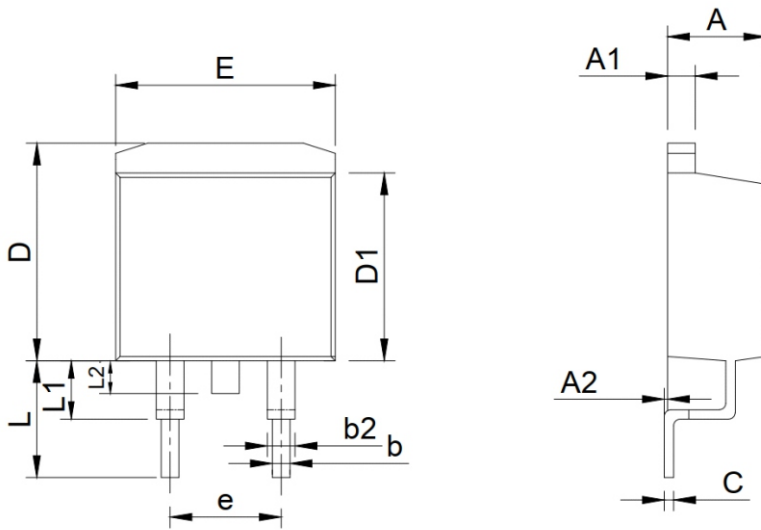


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.24	4.9	0.167	0.193
A1	2.3	2.92	0.091	0.115
A2	2.61	2.81	0.103	0.111
b	0.3	1	0.012	0.039
b1	0.9	1.55	0.035	0.061
C	0.3	0.7	0.012	0.028
D	14.5	16.36	0.571	0.644
D1	8.8	9.41	0.346	0.370
E	9.5	10.5	0.374	0.413
e	2.3	2.75	0.091	0.108
L	12.6	14	0.496	0.551
L1	2.45	4.3	0.096	0.169
P	2.9	3.8	0.114	0.150
Q	2.5	3.55	0.098	0.140

SJ5N80 Series

Dimensions

TO-263 PACKAGE OUTLINE DIMENSIONS

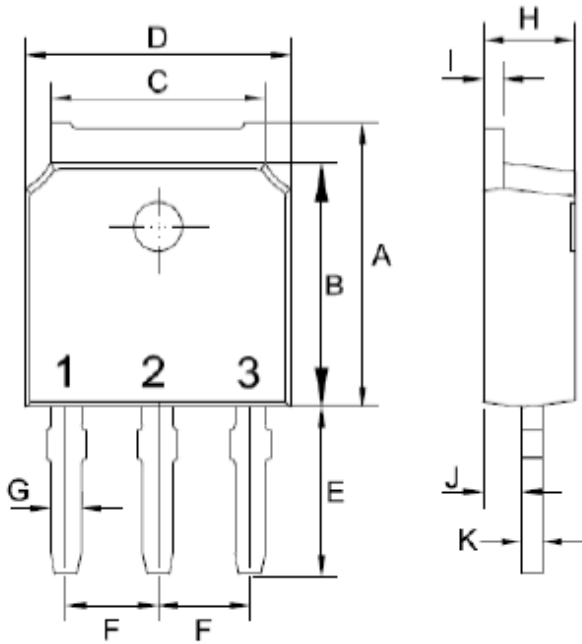


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	0	0.25	0.000	0.010
b	0.61	1.01	0.024	0.040
b1	1.2	1.34	0.047	0.053
C	0.3	0.6	0.012	0.024
D	9.48	10.84	0.373	0.427
D1	8.49	9.3	0.334	0.366
E	9.7	10.31	0.382	0.406
e	4.88	5.28	0.192	0.208
L	4.46	5.85	0.176	0.230
L1	1.33	2.33	0.052	0.092
L2	0	2.2	0.000	0.087

SJ5N80 Series

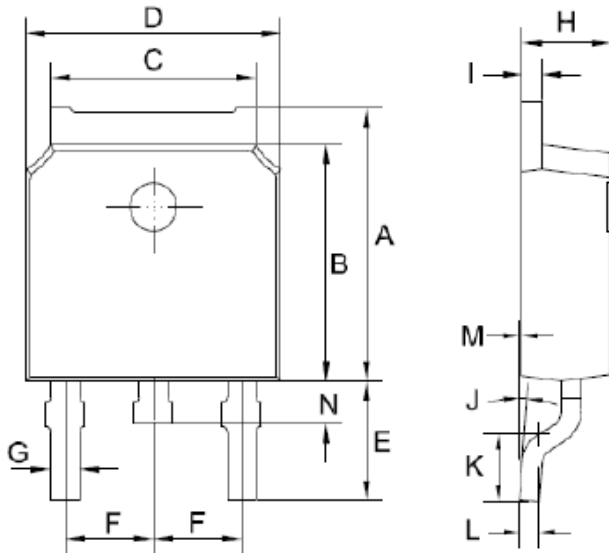
Dimensions

TO-251 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	3.5	4.35	0.138	0.171
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0.71	1.31	0.028	0.052
K	0.41	0.61	0.016	0.024

TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	2.6	3.3	0.102	0.130
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0°	8°	0°	8°
K	1.45	1.85	0.057	0.073
L	0.41	0.61	0.016	0.024
M	0	0.12	0.000	0.005
P	0.6	1	0.024	0.039

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