

Features

- Very low FOM $R_{DS(on)} \times Q_g$
- 100% avalanche tested

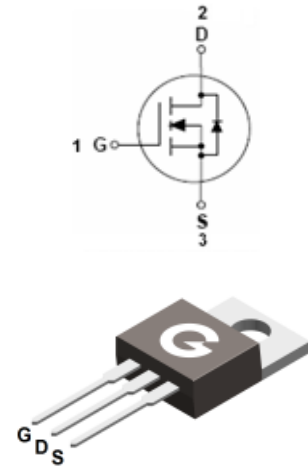
HF

APPLICATIONS

- SMPS
- UPS
- PFC

Mechanical Data

- Case: TO-220AB
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



TO-220AB

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
SJ80R350	TO-220AB	50 pcs / Tube	SJ80R350

Maximum Ratings (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	800	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	15	A
Pulsed Drain Current ^{*1}	I_{DM}	45	A
Single Pulse Avalanche Energy ^{*2}	E_{AS}	324	mJ
Avalanche Current ^{*1}	I_{AR}	4	A
Repetitive Avalanche Energy ^{*1}	E_{AR}	0.75	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation	P_D	34	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.83	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	-	-	1	μA
		$V_{DS} = 800V, V_{GS} = 0V, T_J = 150^\circ\text{C}$	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-resistance ^{*3}	$V_{GS} = 10V, I_D = 7.5A$	-	0.26	0.35	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	-	4.5	V
g_{fs}	Forward Transconductance ^{*3}	$V_{GS} = 10V, I_D = 7.5A$	-	18.8	-	S
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 1.0\text{MHz}$	-	2330	-	pF
C_{OSS}	Output Capacitance		-	116	-	
C_{RSS}	Reverse Transfer Capacitance		-	7	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD} = 400V$ $R_G = 25\Omega$ $I_D = 15A$	-	43	-	ns
t_r	Turn-on Rise Time		-	14	-	
$t_{d(OFF)}$	Turn-Off Delay Time		-	150	-	
t_f	Turn-Off Fall Time		-	7	-	
Q_G	Total Gate-Charge	$V_{DD} = 640V$ $V_{GS} = 10V$ $I_D = 15A$	-	46	-	nC
Q_{GS}	Gate to Source Charge		-	11	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	13	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage	$I_{SD} = 15A, V_{GS} = 0V, T_J = 25^\circ\text{C}$	-	0.9	1.2	V
I_S	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$	-	-	15	A
I_{SM}	Pulsed Source-Drain Current		-	-	45	A
t_{rr}	Reverse Recovery Time	$I_S = I_F, V_R = 400V$	-	460	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt = 100A/\mu s$	-	3.8	-	μC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = 4A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Figure 1. Output Characteristics

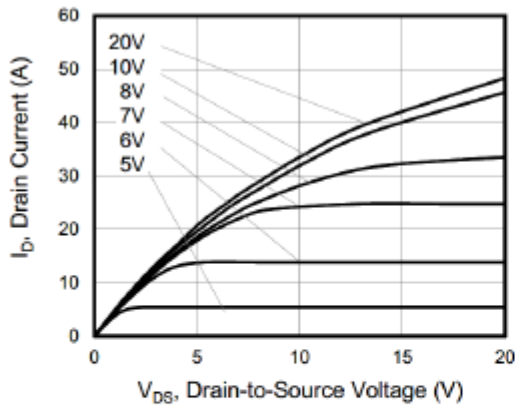


Figure 2. Transfer Characteristics

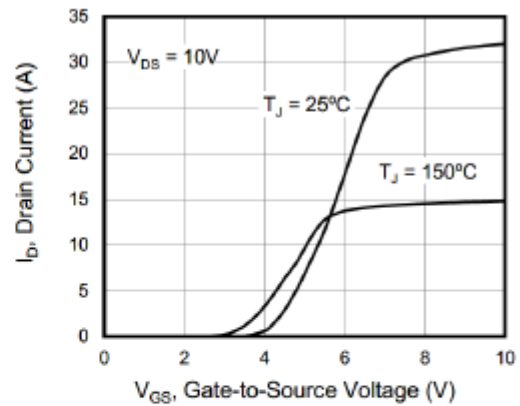


Figure 3. On-Resistance vs. Drain Current

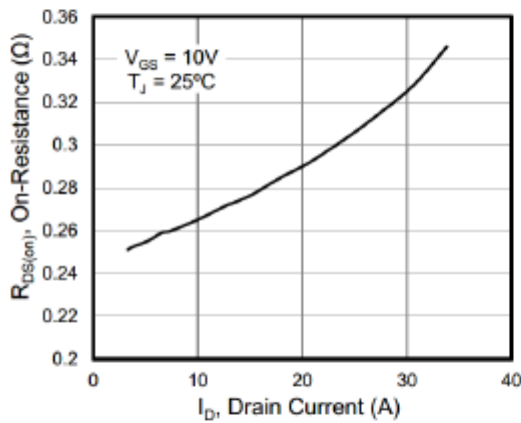


Figure 4. Capacitance

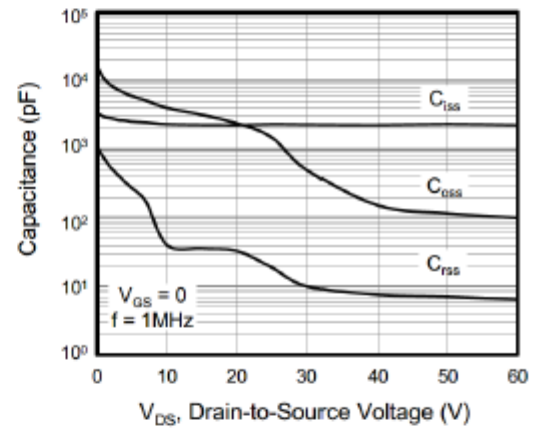


Figure 5. Gate Charge

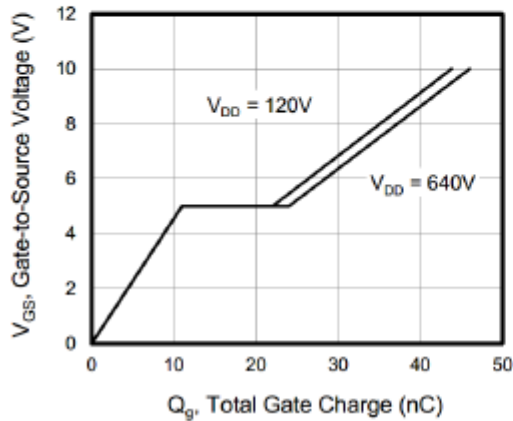


Figure 6. Body Diode Forward Voltage

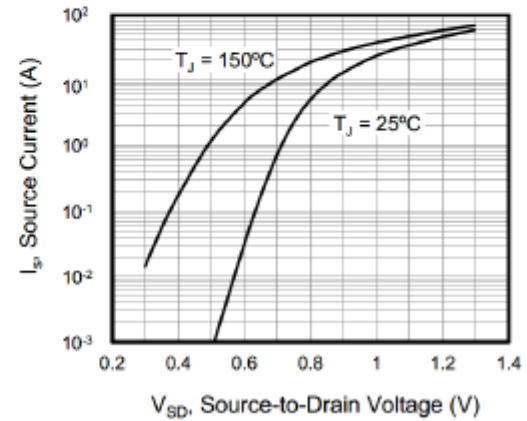


Figure 7. On-Resistance vs. Junction Temperature

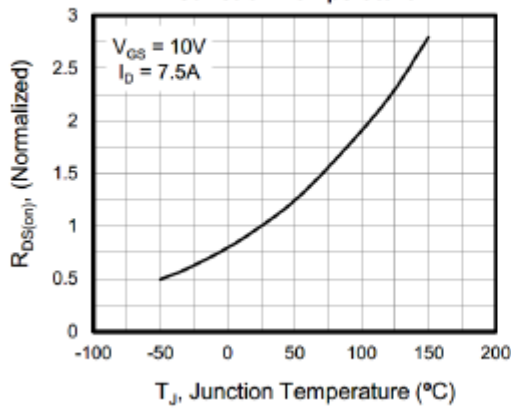
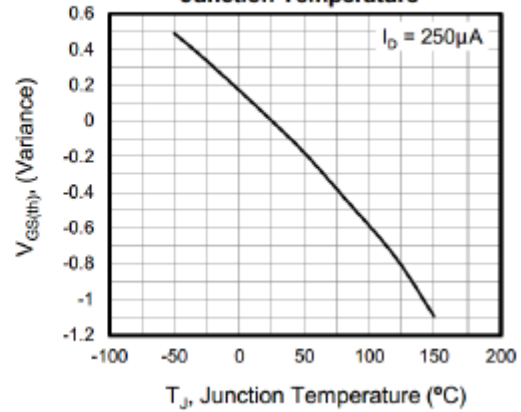
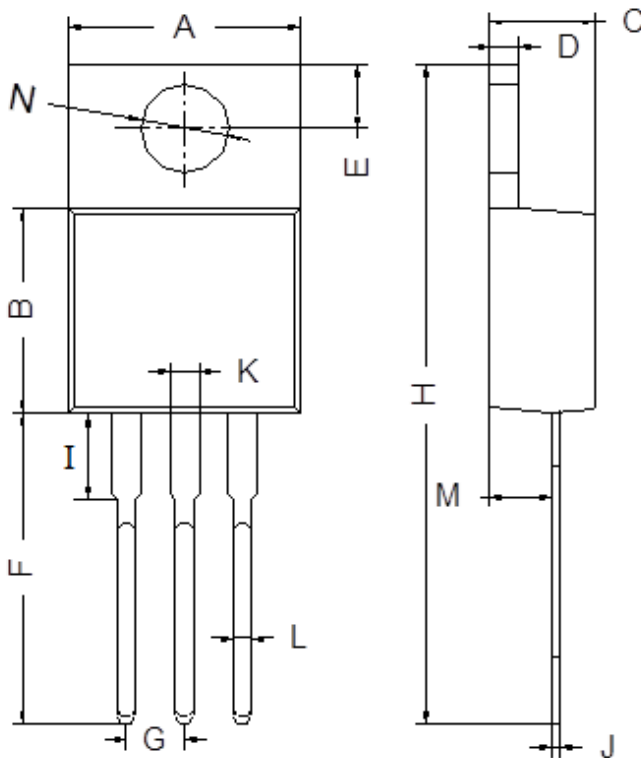


Figure 8. Threshold Voltage vs. Junction Temperature



Package Outline Dimensions (Unit: mm)



TO-220AB		
Dimension	Min.	Max.
A	9.80	10.30
B	8.70	9.10
C	4.37	4.77
D	1.07	1.47
E	2.64	2.84
F	13.14	13.74
G	2.44	2.64
H	28.03	28.83
I	3.50	4.00
J	0.28	0.48
K	1.22	1.32
L	0.71	0.91
M	2.40	2.60
N	3.76	3.96

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