3080Q（文件编号：S&CIC1968） 30V N-channel enhancement mode MOSFET

Description

Features

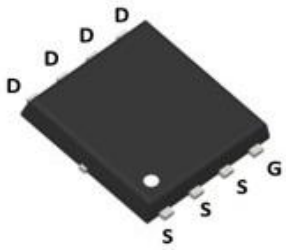
- Extremely Low RDS(on):4.0mΩ @V_{GS}=10 V, Id=40 A
- Good stability and uniformity
- 100% avalanche tested

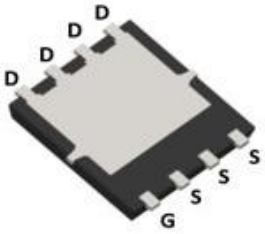
Excellent package for good heat dissipation

General Description

The 3080 uses advanced trench Typ.RDS(on) = 4.0 mΩ technology to provide excellent RDS(ON), low gate charge This device is suitable for use in UPS, power switching and general purpose applications.

Package





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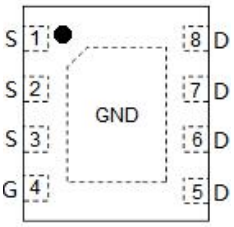
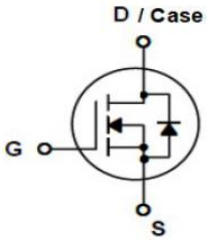


Marking and pin Assignment



Schematic Diagram

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.01	℃/W

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	30	V
I_D	Drain Current - Continuous (TC= 25°C)	80	A
	- Continuous (TC= 100°C)	45*	A
I_{DM}	Drain Current - Pulsed (Note 1)	185*	A
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	196	mJ
P_D	Power Dissipation (TC = 25°C)	76	W
	- Derate above 25°C	0.52	W/°C
T_j , T_{stg}	Operating and Storage Temperature Range	-55 to +168	°C

* Drain current limited by maximum junction temperature

Electrical Characteristics（TC = 25°C unless otherwise noted）

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30 V, V_{GS} = 0 V			1	μA
I_{GSSF}	Gate Leakage Current, Forward	V_{GS} = 20 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate Leakage Current, Reverse	V_{GS} = -20 V, V_{DS} = 0 V			-100	nA
On Characteristics						
$V_{GS(TH)}$	Gate Threshold voltage	V_{DS} = V_{GS}, I_D = 250 uA	1	1.5	2	V
$R_{DS(On)}$	Drain-Source on-state resistance	V_{GS} = 10 V, I_D = 40 A		4.0	5.2	mΩ
		V_{GS} = 4.5 V, I_D = 24 A		5.8	8.5	mΩ
gFS	Forward Transconductance	V_{DS} = 5 V, I_D = 24 A(Note 3)	20			S
Dynamic Characteristics						
C_{iss}	Input capacitance	VDS=25V, VGS=0V, F=1.0Mhz		1860		pF
C_{oss}	Output capacitance			242		pF
C_{rss}	Reverse transfer capacitance			218		pF
Switching Characteristics						
$t_{d(on)}$	Turn On Delay Time	VDD=15V, ID=60A, VGS=4.5V, RG=1.8Ohm (Note 3, 4)		11.5		ns
t_r	Rising Time			164		ns
$t_{d(off)}$	Turn Off Delay Time			12.8		ns
t_f	Fall Time			81		ns
Q_g	Total Gate Charge	VDD=15V, ID=30A, VGS=10V (Note 3, 4)		40		nC
Q_{gs}	Gate-Source Charge			5.6		nC
Q_{gd}	Gate-Drain Charge			9.8		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current				80	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current				185	A
V_{SD}	Diode Forward Voltage	V_{GS}= 0 V, I_S = 24 A			1.2	V
T_{rr}	Reverse recovery time	IF=60A, di/dt=100A/μS		14		ns
Q_{rr}	Reverse recovery charge			2.6		nC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 0.5 mH, IAS = 35 A, V_{DD} = 20V, R_G = 25 Ω, Starting T_j = 25°C
3. I_{SD} ≤ 40A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_j =25°C
4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

Typical Performance Characteristics

Figure1: Output Characteristics

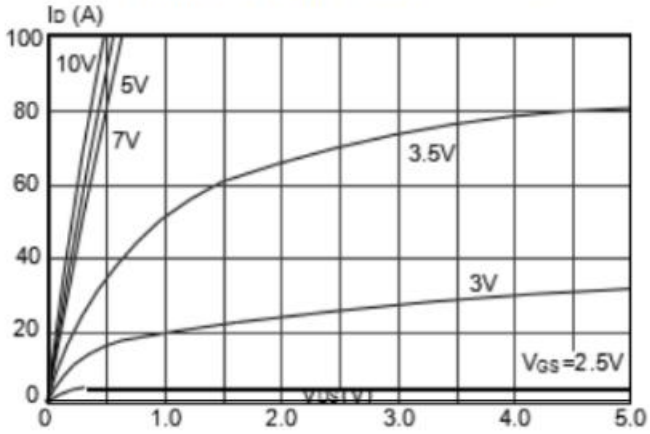


Figure 2: Typical Transfer Characteristics

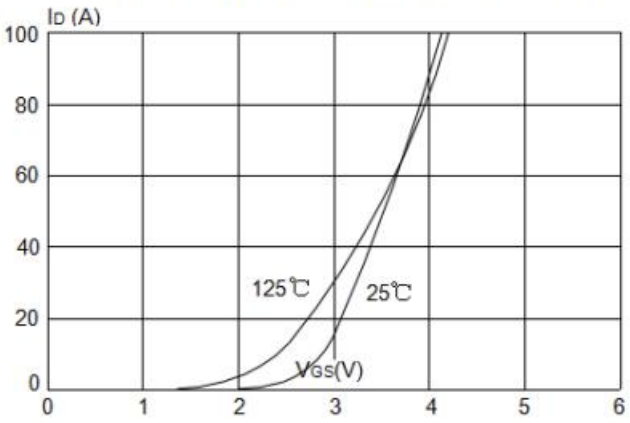


Figure 3: On-resistance vs. Drain Current

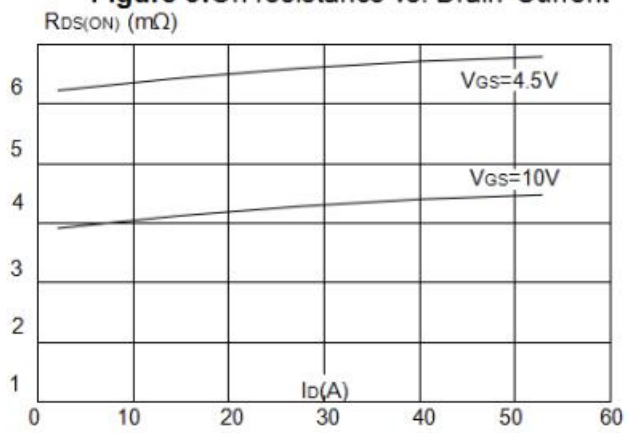


Figure 4: Body Diode Characteristics

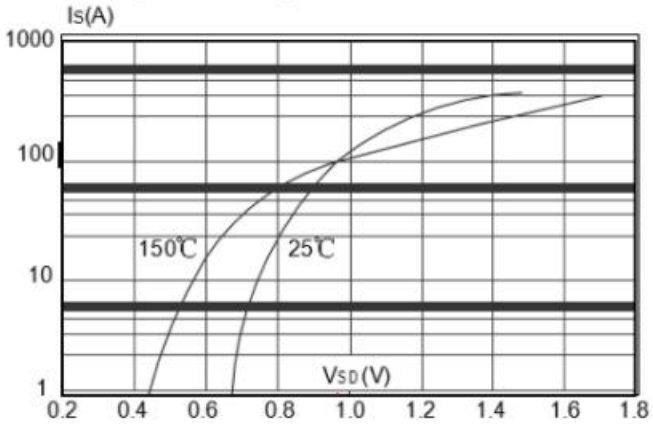


Figure 5: Gate Charge Characteristics

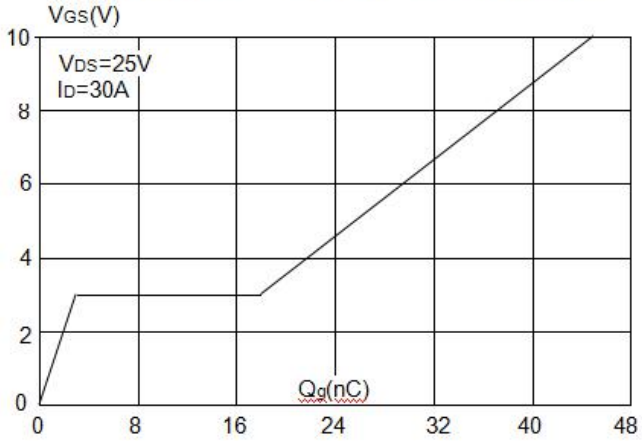


Figure 6: Capacitance Characteristics

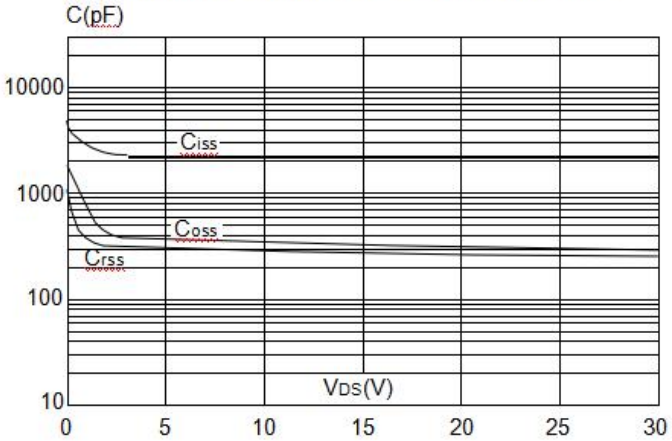


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

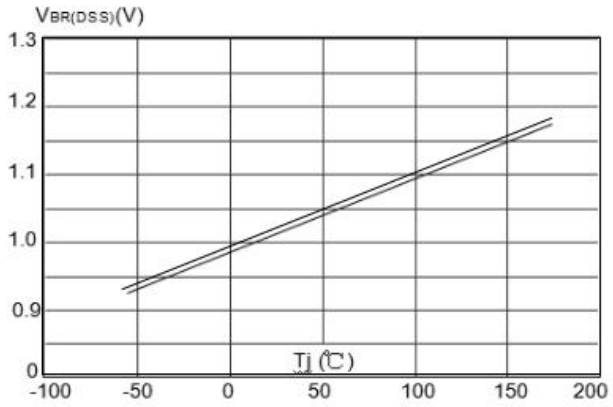


Figure 8: Normalized on Resistance vs. Junction Temperature

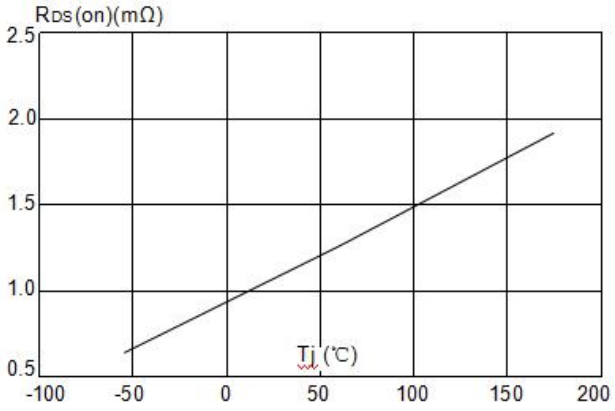


Figure 9: Maximum Safe Operating Area

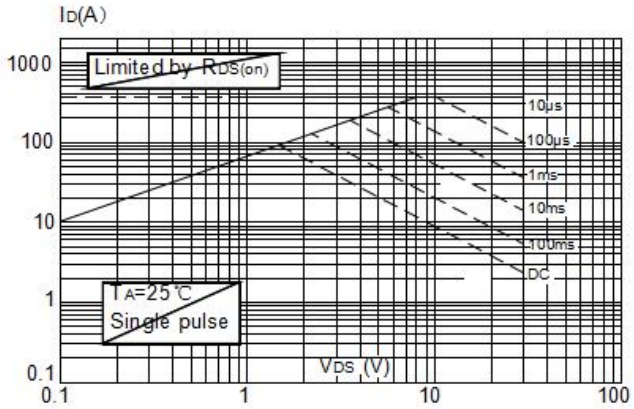


Figure 10: Maximum Continuous Drain Currentvs. Case Temperature

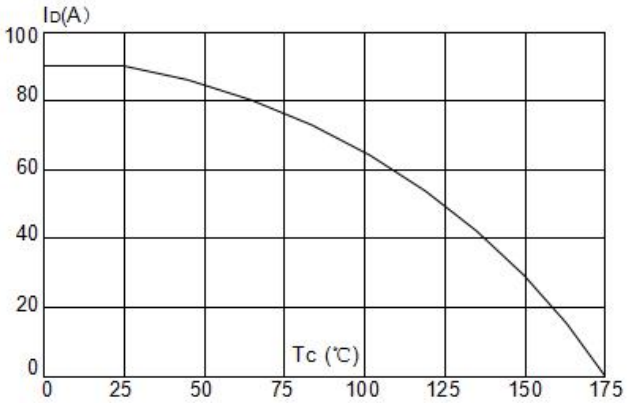
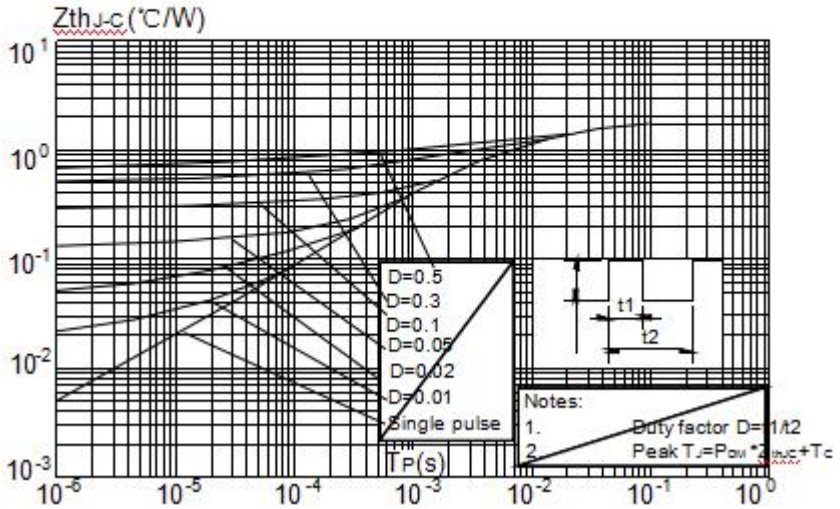
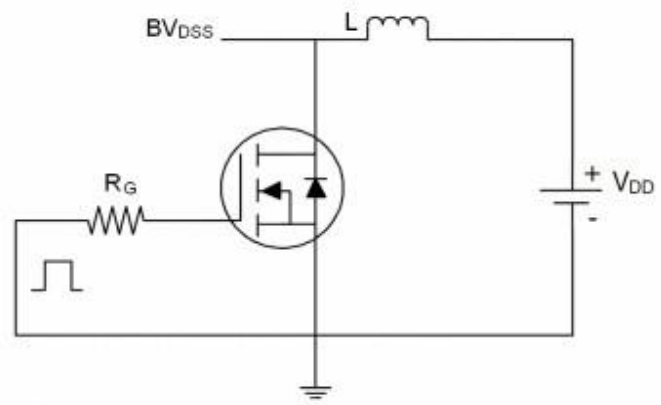


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)

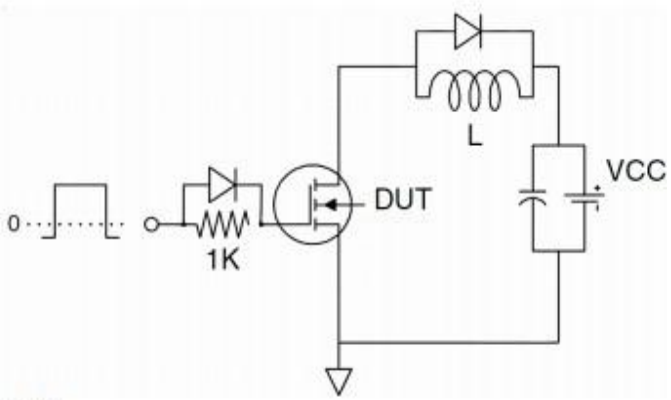


Test Circuit

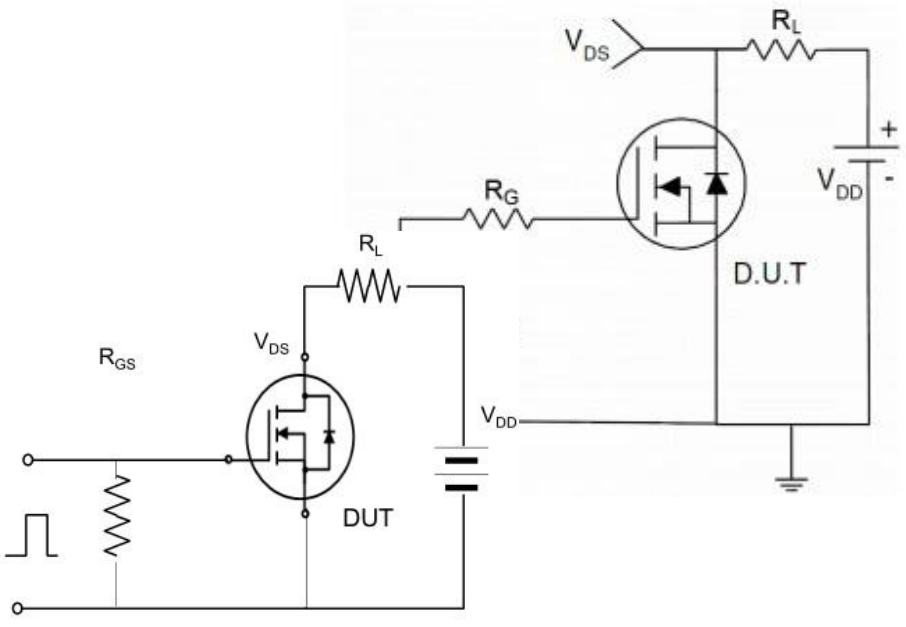
1) E_{AS} Test Circuits



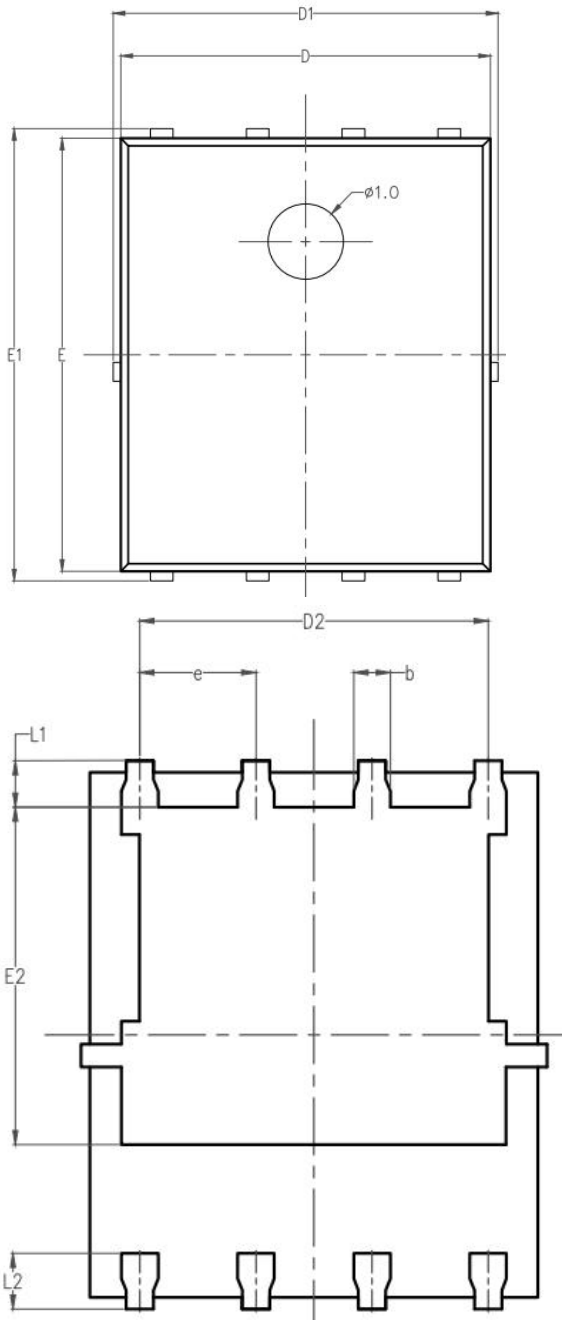
2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



PDFN5x6-8L Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.95	1.00	1.05
A1	0.254REF.		
b	0.41	0.46	0.51
D	4.85	4.90	4.95
D1	4.90	5.00	5.10
D2	3.766	3.816	3.866
E	5.696	5.746	5.796
E1	5.95	6.00	6.05
E2	3.525	3.575	3.625
e	1.22	1.27	1.32
L1	0.46	0.51	0.56
L2	0.56	0.61	0.66