



产品规格书

DP4080 (TO-252)

Datasheet of DP4080 (TO-252)

深圳市德普微电子有限公司

Shenzhen Developer Microelectronics Co., Ltd.

地址：深圳市南山区高新南四道创维半导体设计大厦西座707-710单元

Address: Unit 7-10, 7/F., west block, Skyworth Semiconductor design Building,

The 4th on High-tech Zone, Nanshan District, Shenzhen



Features

- Uses CRM(CQ) advanced Trench MOS technology
- Extremely low on-resistance RDS(on)
- Excellent QgxRDS(on) product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

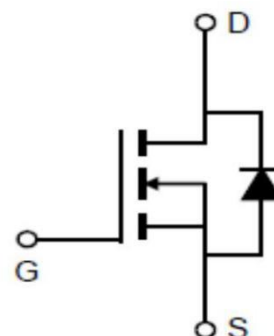
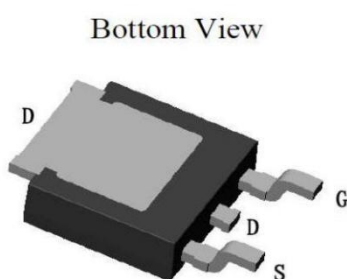
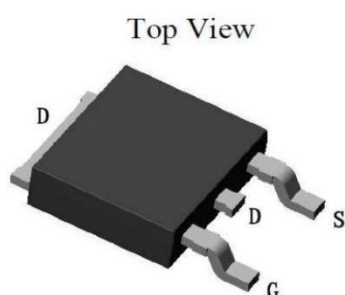
Product Summary

Vds	40V
ID	80A
RDS(ON) typ(at VGS = 10V)	6mΩ
RDS(ON) typ(at VGS = 4.5V)	8mΩ

100% DVDS Tested

100% Avalanche Tested

TO-252



Absolute Maximum Ratings TA=25°C unless otherwise noted

Parameter	Symbol	P-Channel	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	80	A
Drain Current-Continuous(T=100°C)	I _D (100°C)	61	A
Pulsed drain current (TC = 25°C, tp limited by Tjmax)	I _D pulse	320	A
Avalanche energy, single pulse (L=0.3mH, Rg=25Ω)	EAS	145	mJ
Power dissipation (TC = 25°C)	P _{tot}	81	W
Operating junction and storage temperature	T _j , T _{stg}	-55 To 150	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R _{thJC}	12	°C/W
Thermal resistance, junction – ambient(min. footprint)	R _{thJA}	70	



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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V V _{GS} =0V	-	0.01	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	±5	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =1A	-	6	8	mΩ
		V _{GS} =4.5V, I _D =1A	-	8	10.5	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =40A	-	90	-	S
Dynamic Characteristics ^b						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz	-	2165	-	pF
Output Capacitance	C _{oss}		-	278	-	
Reverse Transfer Capacitance	C _{rss}		-	210	-	
Switching Characteristics ^b						
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =15V, R _{G_ext} =2.7Ω, I _D =40A,	-	7.6	-	nS
Turn-on Rise Time	t _r		-	80	-	nS
Turn-Off Delay Time	t _{d(off)}		-	46	-	nS
Turn-Off Fall Time	t _f		-	91	-	nS
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =15V, I _D =40A, f=1MHz	-	48	-	nC
Gate-Source Charge	Q _{gs}		-	9	-	nC
Gate-Drain Charge	Q _{gd}		-	11	-	nC
Gate resistance	R _G	V _{GS} =0V, V _{DS} =0V, f=1MHz		2.4		Ω
Body Diode Characteristic						
Parameter	Symbol	Value			Unit	Test Condition
		min.	Typ.	Max.		
Body Diode Forward Voltage	V _{SD}	-	0.8	1.3	V	V _{GS} =0V, I _{SD} =40A
Body Diode Reverse Recovery Time	t _{rr}	-	13		nS	I _F =40A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	-	5		nC	



Typical Performance Characteristics

Figure 1. Typ. Output Characteristics

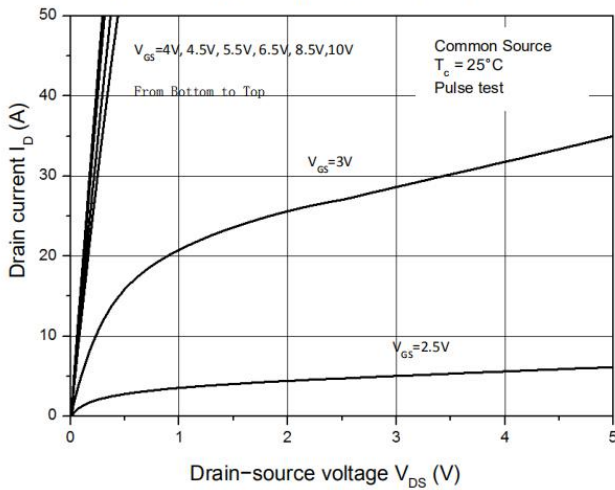


Figure 2. Transfer Characteristics

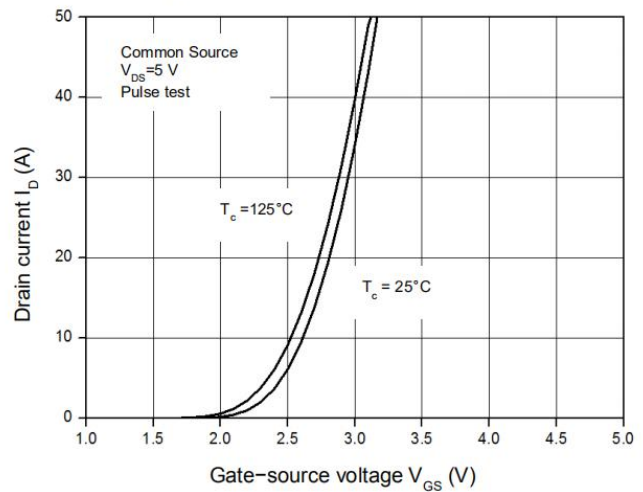


Figure 3. Capacitance Characteristics

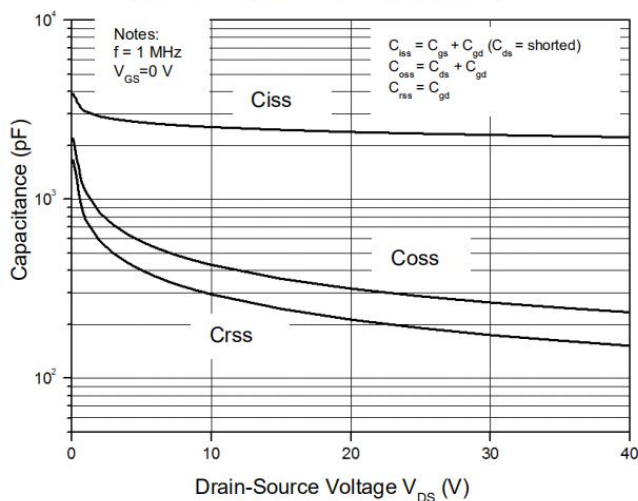


Figure 4. Gate Charge Waveform

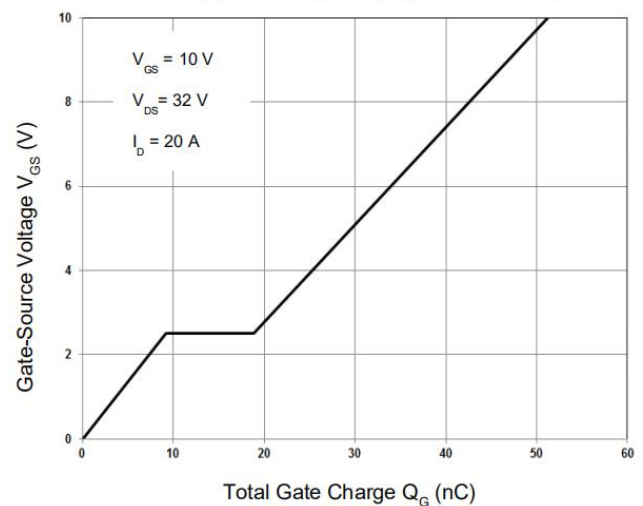


Figure 5. Body-Diode Characteristics

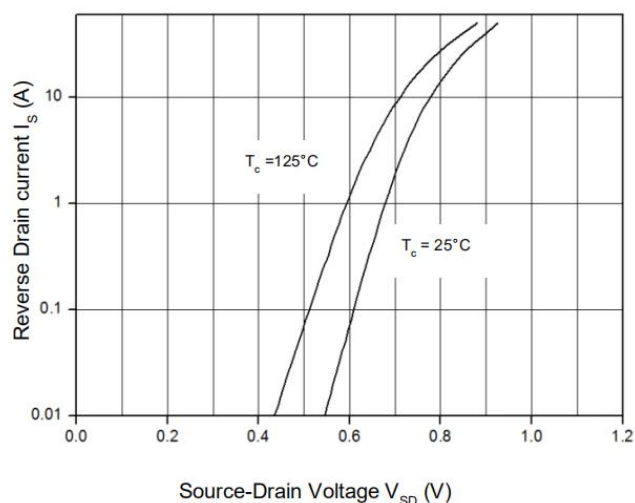


Figure 6. Rdson-Drain Current

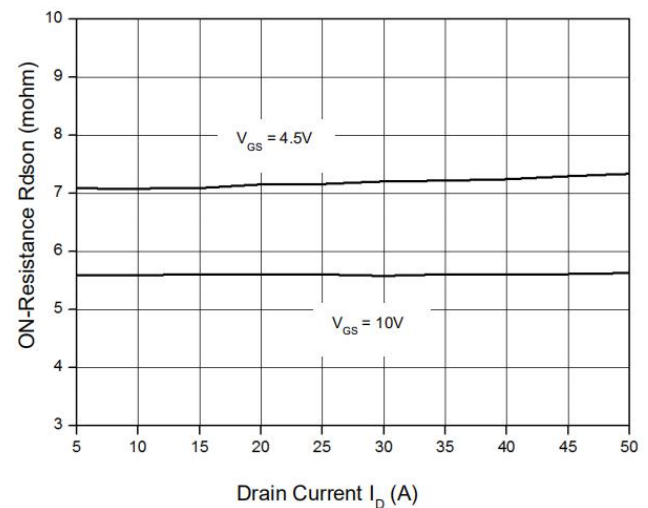




Figure 7. $R_{DS(on)}$ -Junction Temperature(°C)

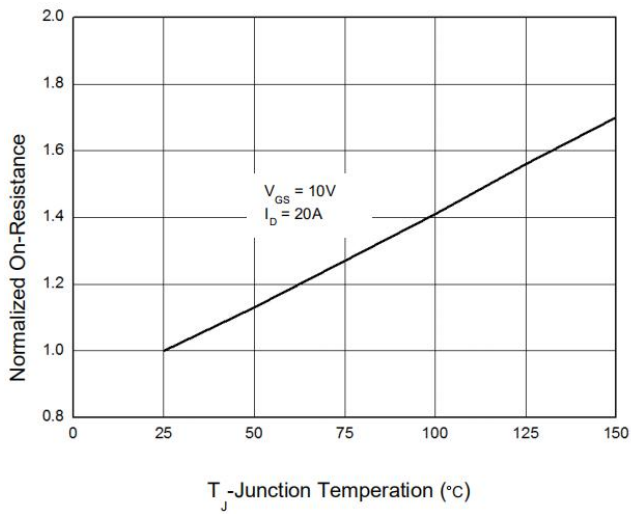


Figure 8. Maximum Safe Operating Area

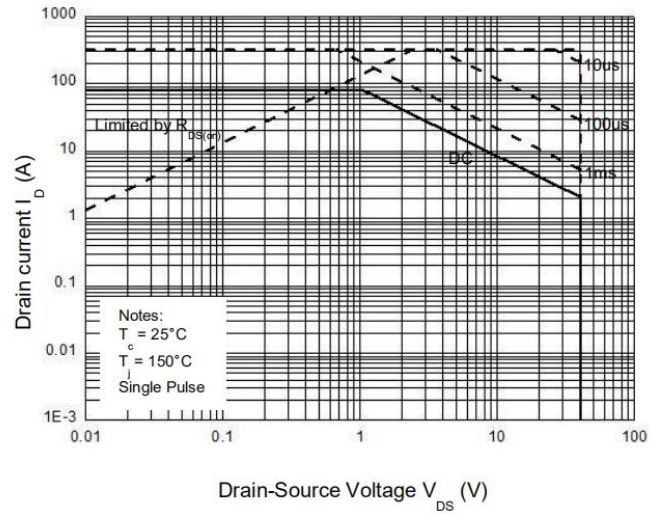
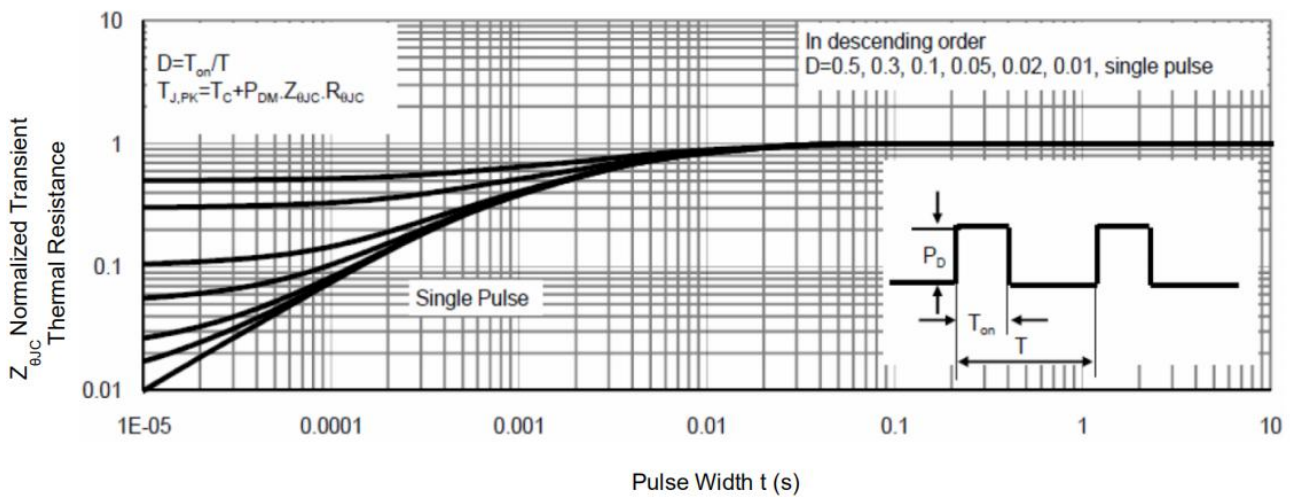


Figure 9. Normalized Maximum Transient Thermal Impedance (R_{thJC})



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

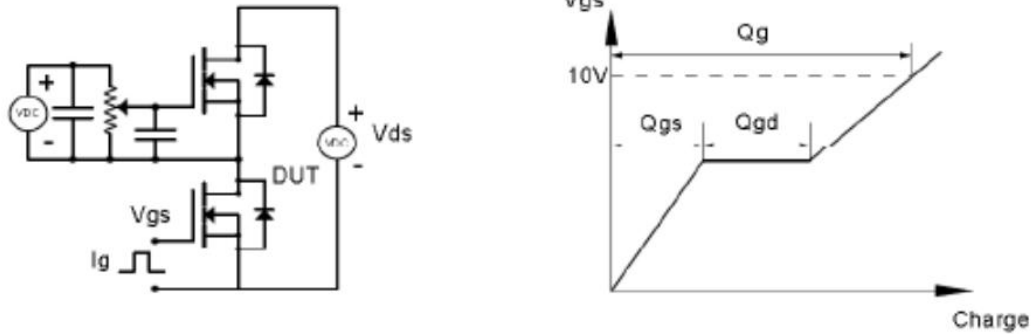


Figure 9. Resistive Switching Test Circuit & Waveforms

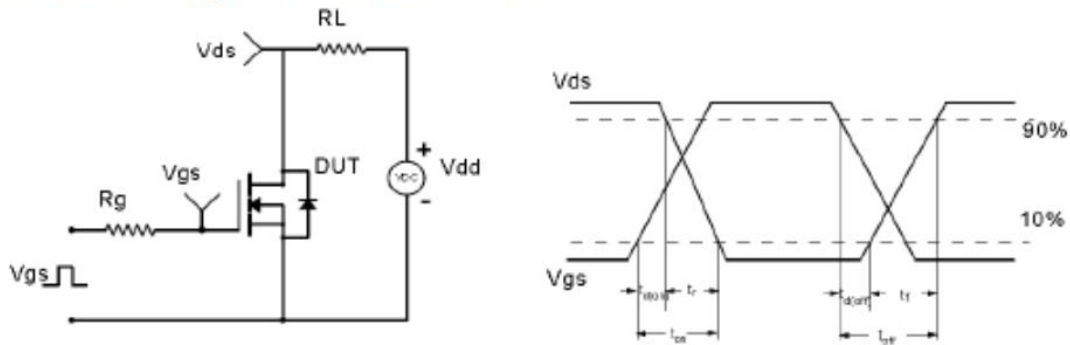


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

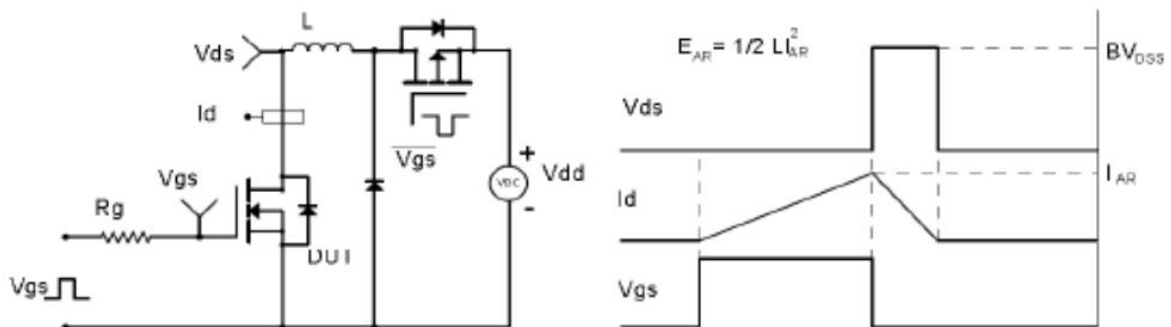
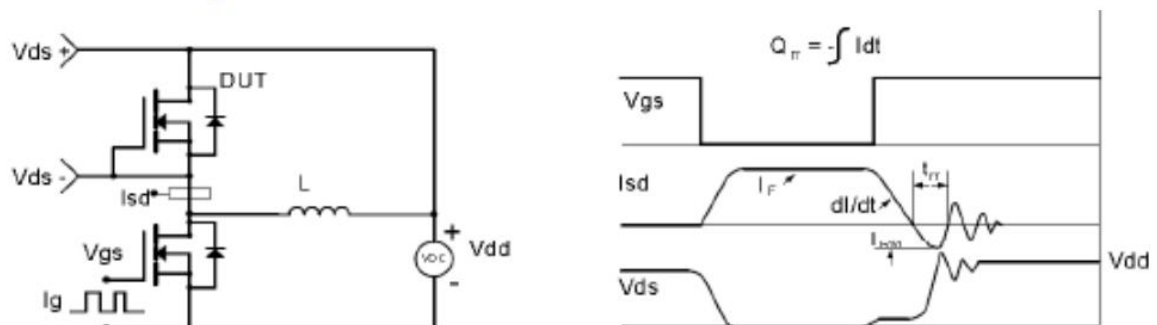
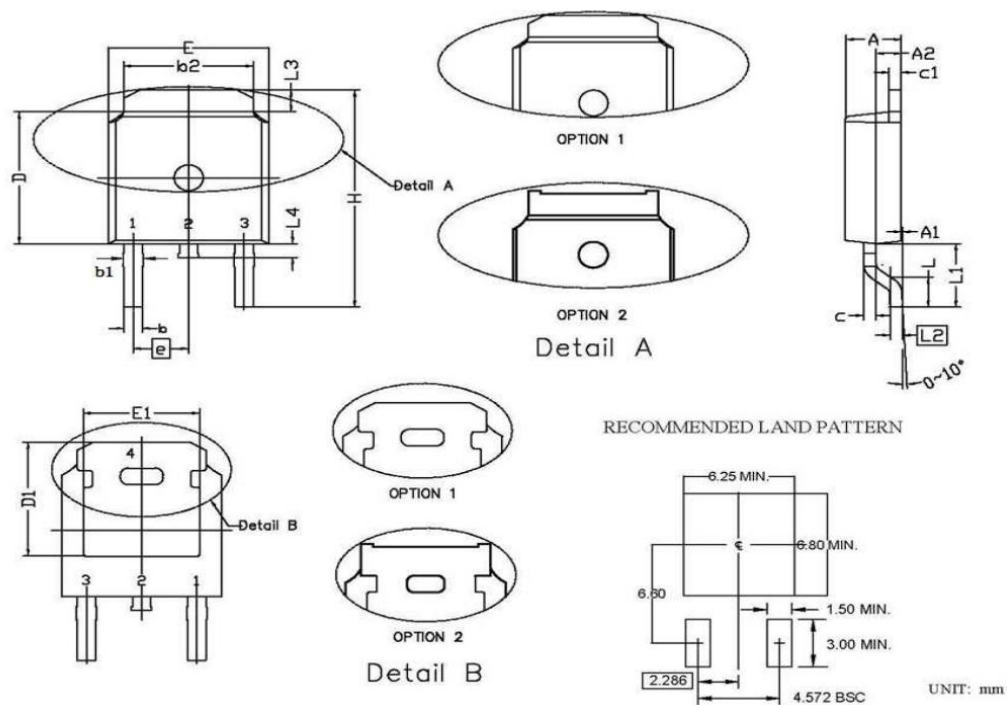


Figure 11. Diode Recovery Circuit & Waveform





Package Outline: TO-252-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047

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