DP8205

Dual N-Channel Enhancement Power MOSFET

GENERAL DESCRIPTION

DP8205 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

PRODUCT SUMMARY

V_{DS}	20 V
I_D (at V_{GS}=4.5V)	5.0A
$R_{DS(ON)}$ (at V_{GS} = 4.5V)	< 29mΩ
$R_{DS(ON)}$ (at V_{GS} = 2.5V)	< 34mΩ

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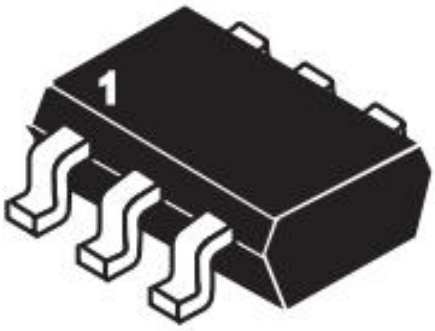

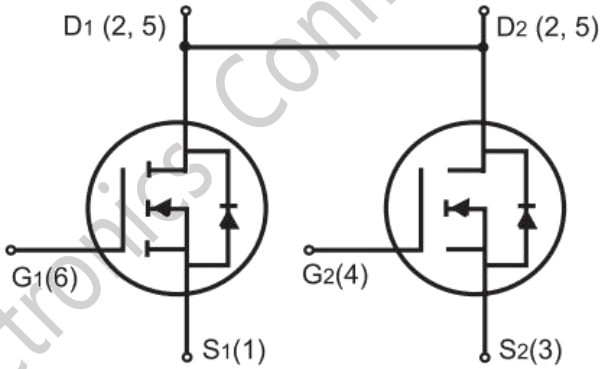

Absolute Maximum Ratings TA=25°C unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous @ T_J=25℃	I_D	5	A
Pulsed[b]	I_{DM}	20	A
Drain-Sourse Diode Forward Current[a]	I_S	2.5	A
Maximum Power Dissipation[a]	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Ambient [a]	$R_{\theta JA}$	100	℃/W

ELECTRICAL CHARACTERISTICS (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.5	0.7	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.5A	14	20	29	mΩ
		V_{GS}=2.5V, I_D=3.5A	17	27	34	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=7A	-	17.7	-	S
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=8V, V_{GS}=0V, F=1.0MHz	-	802	-	pF
Output Capacitance	C_{oss}		-	153	-	pF
Reverse Transfer Capacitance	C_{rss}		-	122	-	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_{GEN}=10Ω , R_L=10Ω	-	18	-	nS
Turn-on Rise Time	t_r		-	5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	43.8	-	nS
Turn-Off Fall Time	t_f		-	20	-	nS
Total Gate Charge	Q_g	V_{DS}=10V, I_D=4A, V_{GS}=4.5V	-	10.5	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	nC
Gate-Drain Charge	Q_{gd}		-	2.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1.7A	-	-	1.2	V

Notes:

a. Surface Mounted on FR4 Board ,T<10 sec ;

b. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

c. Guaranteed by Design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

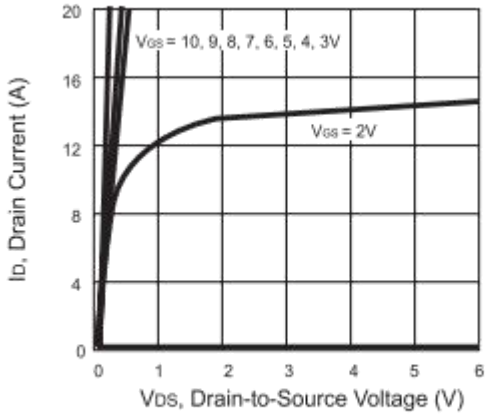

Figure 1. Output Characteristics

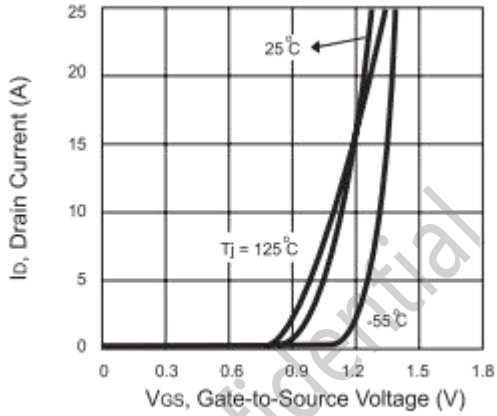

Figure 2. Thansfer Characteristics

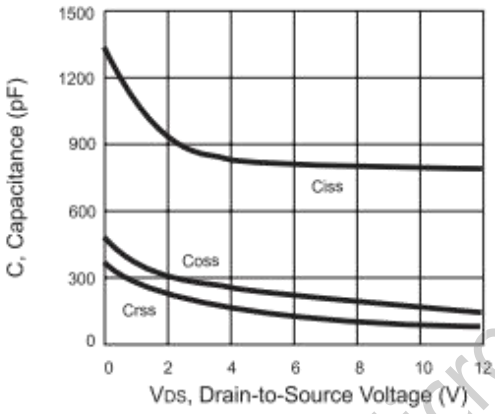

Figure 3. Capacitance

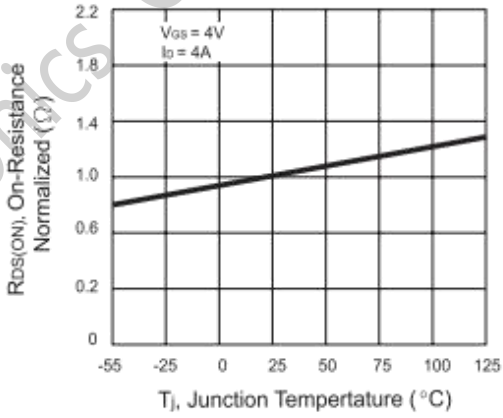

Figure 4. On-Resistance Variation with Temperature

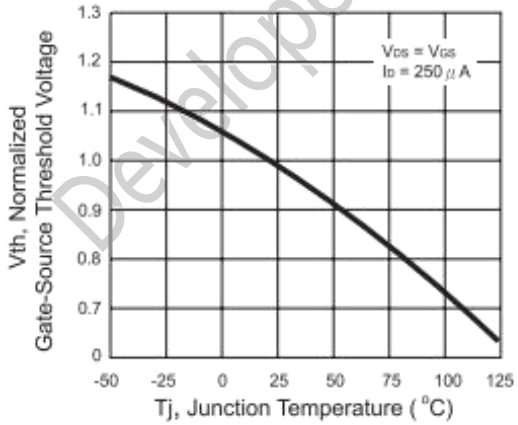

Figure 5. Gate Threshold Variation with Temperature

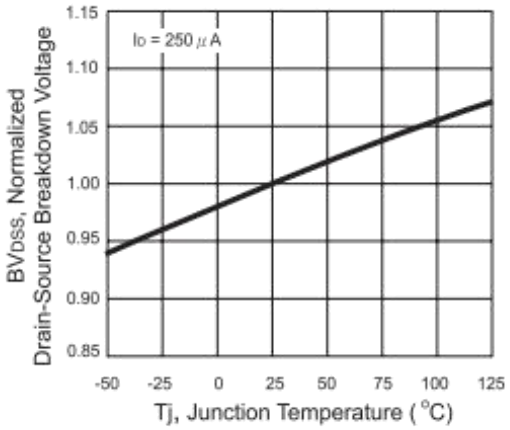

Figure 6. Breakdown Voltage Variation with Temperature

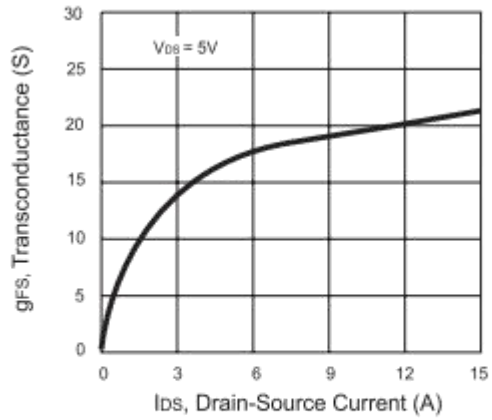

Figure 7. Transconductance Variation with Drain Current

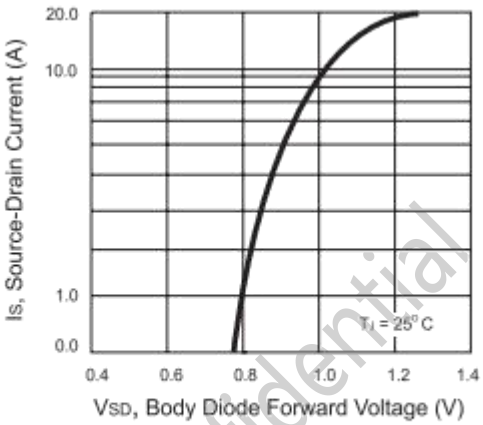

Figure 8. Body Diode Forward Voltage Variation with Source Current

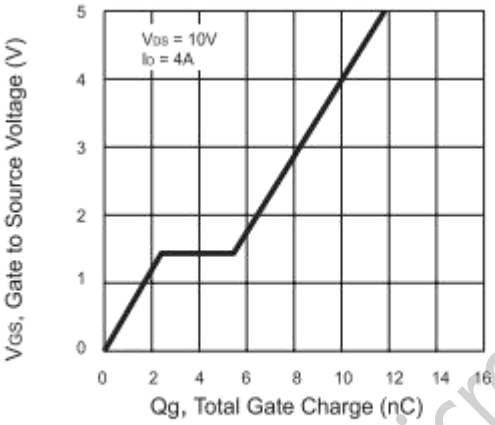

Figure 9. Gate Charge

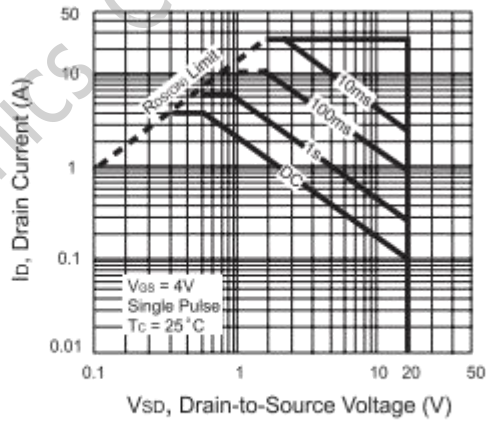

Figure 10. Maximum Safe Operating Area

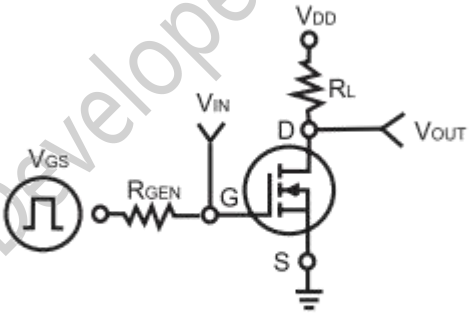

Figure 11. Switching Test Circuit

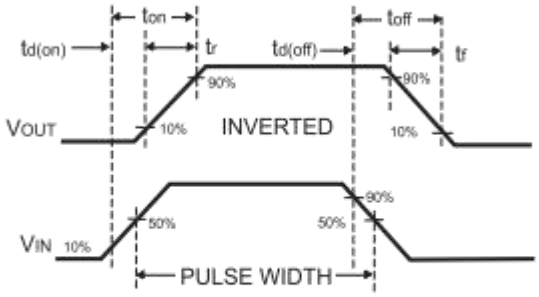

Figure 12. Switching Waveforms

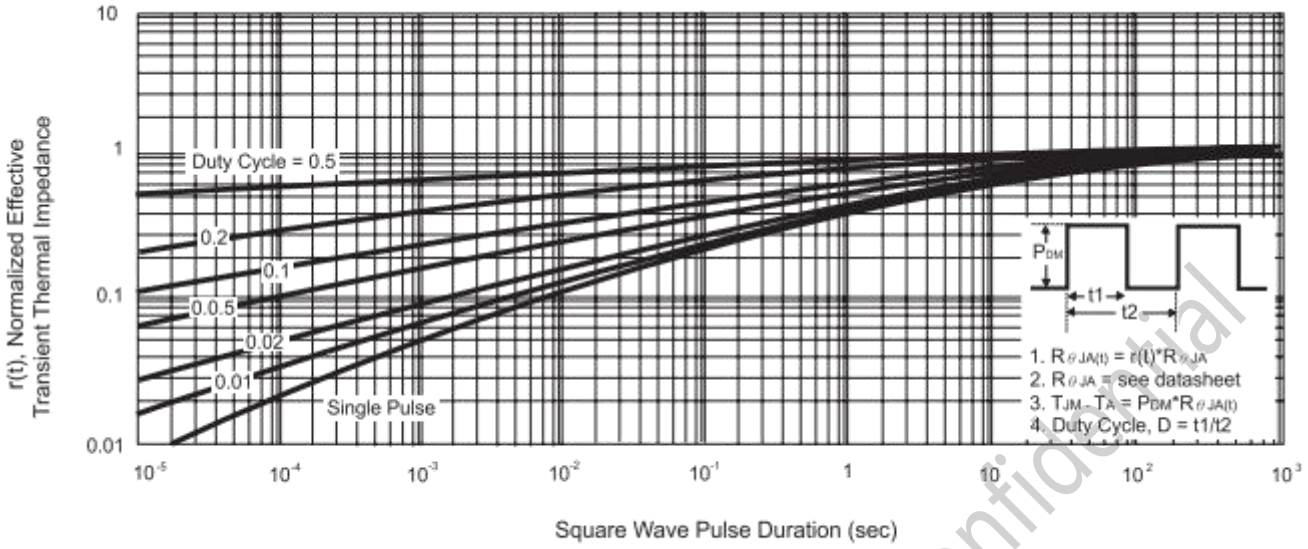

Figure 13. Normalized Thermal Transient Impedance Curve

MARKING DESCRIPSION

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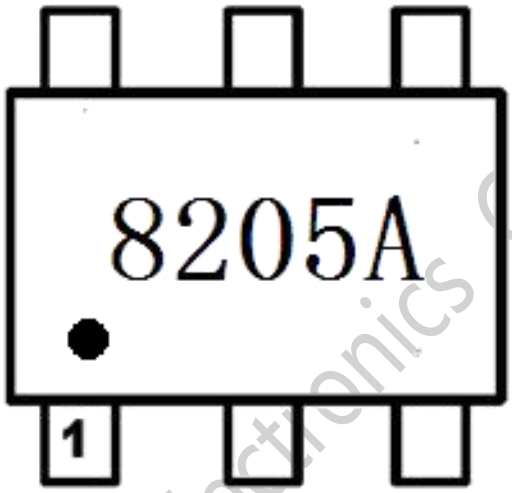

PACKAGE OUTLINE DIMENSIONS

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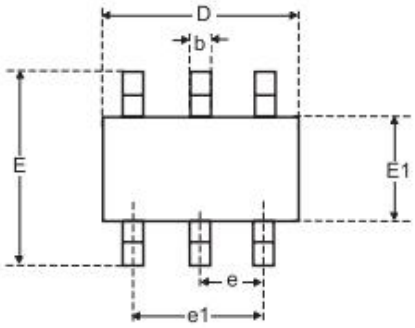

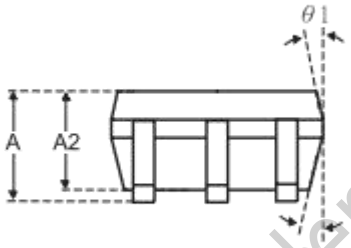

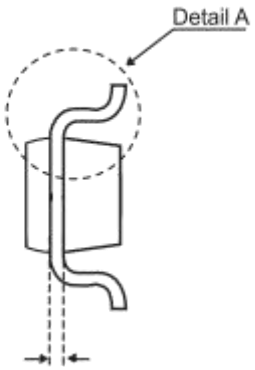

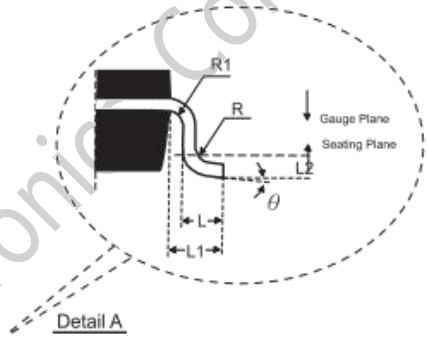

SYMBOLS	MILLIMETERS		
	Min.	Nom.	Max.
A	-	-	1.45
A2	0.90	0.15	1.30
b	0.30	-	0.50
c	0.08	-	0.22
D	2.70	2.90	3.10
E	2.50	2.80	3.10
E1	1.50	1.60	1.70
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.45	0.60
L1	0.60 BSC		
L2	0.20 BSC		
R	0.10	-	-
R1	0.10	-	0.25
θ	0°	4°	8°
θ1	0°	10°	15°

TAPE SIZE

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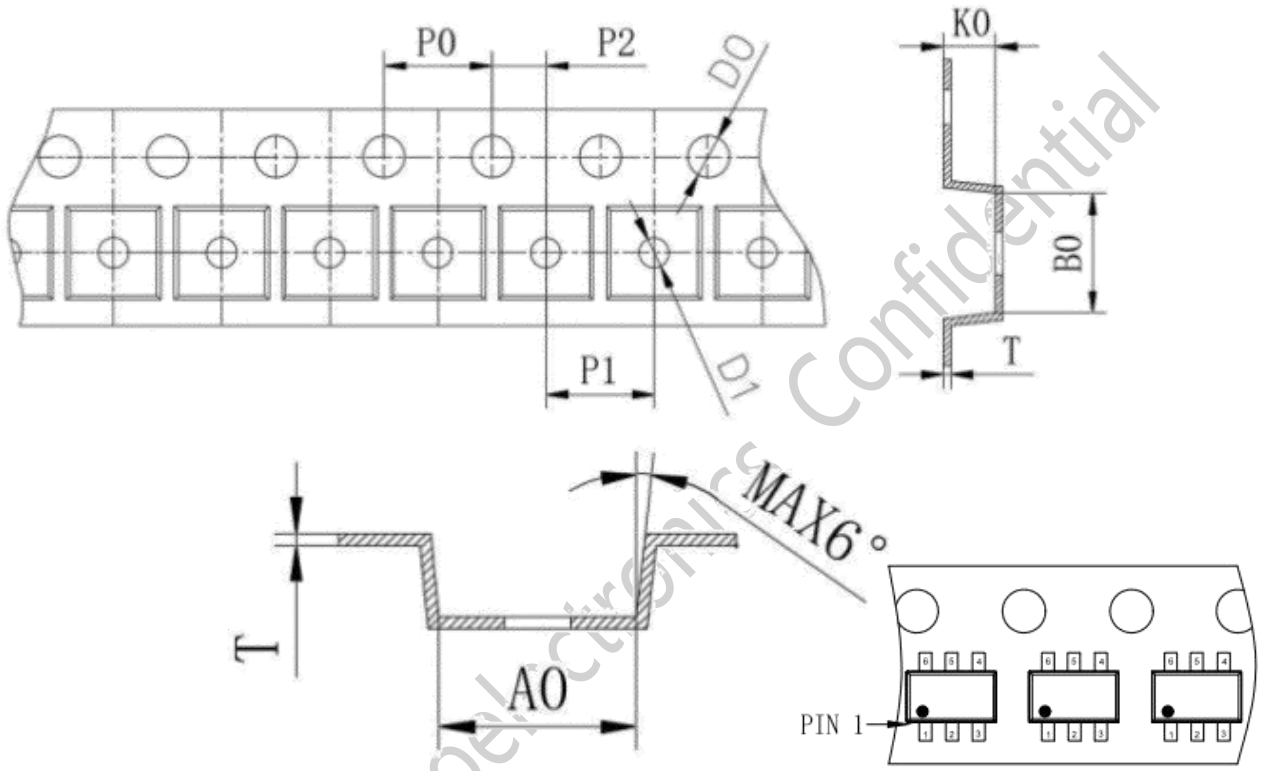

SYMBOL	A0	B0	K0	P0	P1	P2
SPEC	3.23±0.10	3.17±0.10	1.37±0.10	4.00±0.10	4.00±0.10	2.00±0.05
SYMBOL	T	E	F	D0	D1	W
SPEC	0.20±0.05	1.75±0.10	3.50±0.05	1.55±0.05	1.10±0.10	$8.00^{+0.20}_{-0.10}$

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