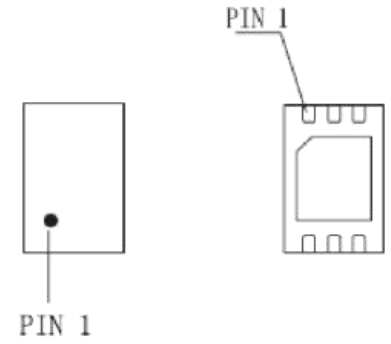
GENERAL DESCRIPTION

DP8204 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.

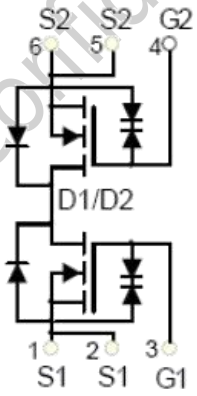
PRODUCT SUMMARY

V_{DS}	20 V
I_D (at V_{GS}=4.5V)	9.5A
$R_{DS(ON)}$ (at V_{GS} = 4.5V)	10.5mΩ
$R_{DS(ON)}$ (at V_{GS} = 3.7V)	11mΩ
$R_{DS(ON)}$ (at V_{GS} = 3.1V)	12mΩ
$R_{DS(ON)}$ (at V_{GS} = 2.5V)	13mΩ

ESD Protected



Top Back



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
Continuous Drain Current [c]	T_A=25°C	I_D	9.5	A
	T_A=70°C		7.6	A
Pulsed Drain Current [a,c]		I_{DM}	60	A
Power Dissipation [B]	T_A=25°C	P_D	1.56	W
	T_A=70°C		1.00	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	°C

THERMAL CHARACTERISTIC

Parameter		Symbol	Limit	Unit
Maximum Junction-to-Ambient	Steady-State	$R_{\theta JA}$	80	°C/W

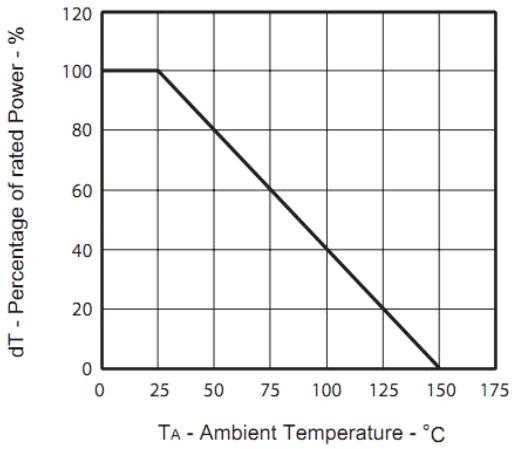
ELECTRICAL CHARACTERISTICS (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typc	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	-	-	±10	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.5	0.85	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.5A	7.5	10.5	13.5	mΩ
		V_{GS}=3.7V, I_D=4.5A	8	11	14	mΩ
		V_{GS}=3.1V, I_D=4.5A	9	12	15	mΩ
		V_{GS}=2.5V, I_D=3.5A	9.5	13	16.5	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=4.75A	-	28	-	S
Dynamic Characteristics [b]						
Input Capacitance	C_{lss}	V_{DS}=10V, V_{GS}=0V, F=1.0MHz	-	980	-	pF
Output Capacitance	C_{oss}		-	213	-	pF
Reverse Transfer Capacitance	C_{rss}		-	189	-	pF
Switching Characteristics [b]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=16V, I_D=4.75A V_{GS}=4.5V, R_{GEN}=6Ω ,	-	24	-	nS
Turn-on Rise Time	t_r		-	66	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	116	-	nS
Turn-Off Fall Time	t_f		-	46	-	nS
Total Gate Charge	Q_g	V_{DS}=16V, I_D=9.5A, V_{GS}=4.5V	-	10.7	-	nC
Gate-Source Charge	Q_{gs}		-	2.1	-	nC
Gate-Drain Charge	Q_{gd}		-	5.4	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1.7A	-	0.8	1.2	V
Maximum Body-Diode	I_S	-	-	-	2.6	A

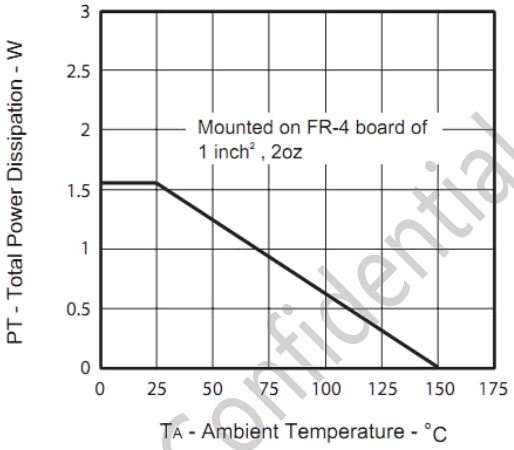
Notes
a.Pulse Test:Pulse Width < 10us, Duty Cycle < 1%.
b.Guaranteed by design, not subject to production testing.
c.Drain current limited by maximum junction temperature.
d.Mounted on FR4 Board of 1 inch2 , 2oz.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

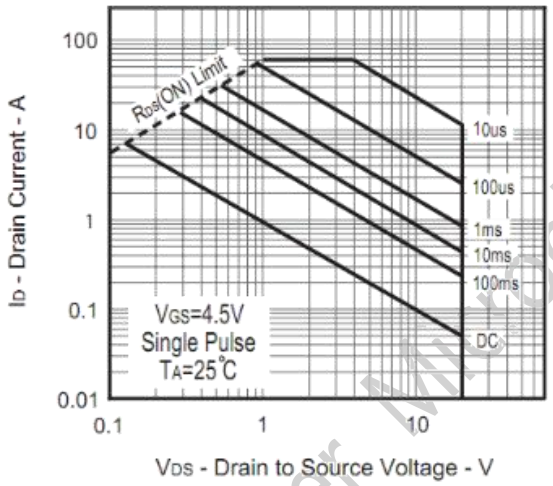
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



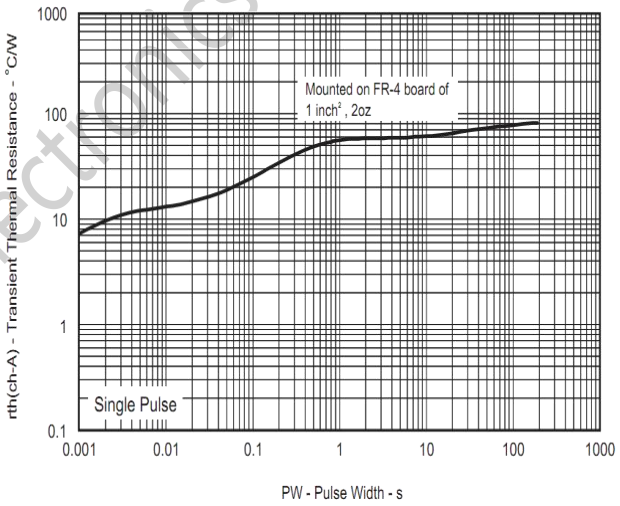
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



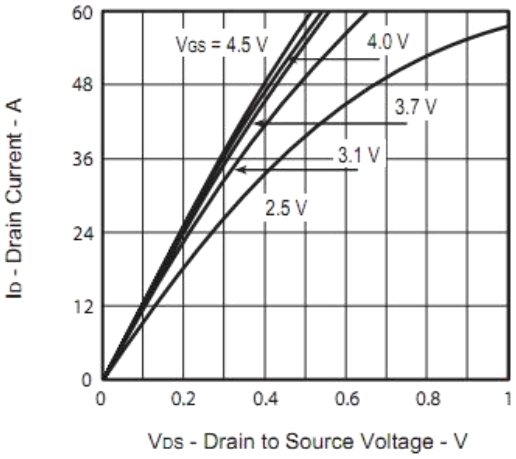
FORWARD BIAS SAFE OPERATING AREA



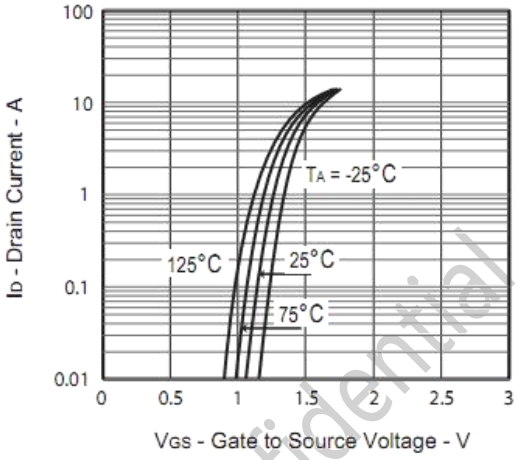
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



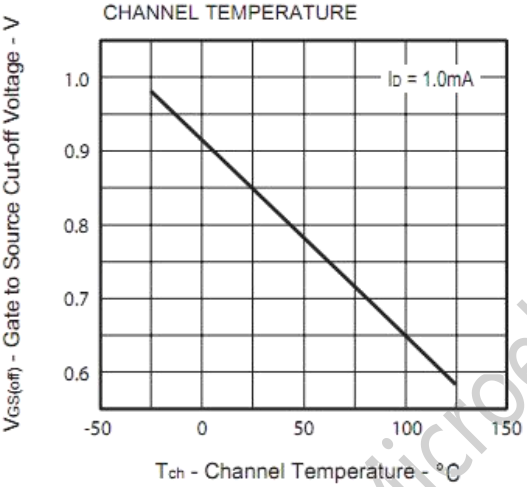
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



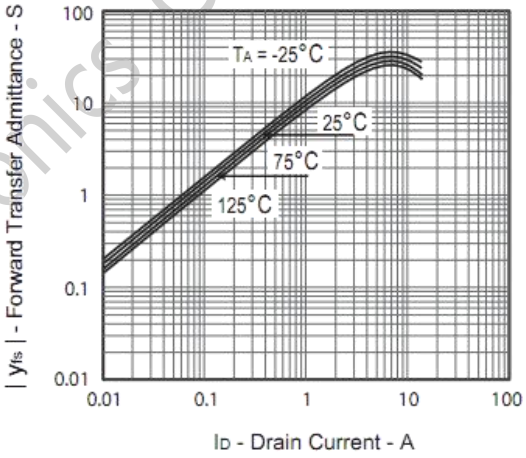
FORWARD TRANSFER CHARACTERISTICS



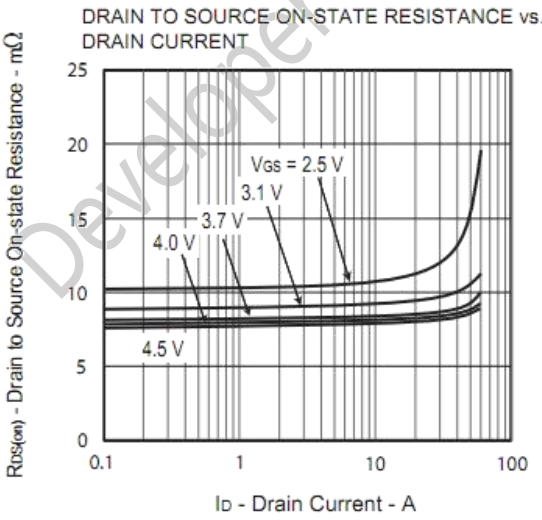
GATEBTO SOURE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



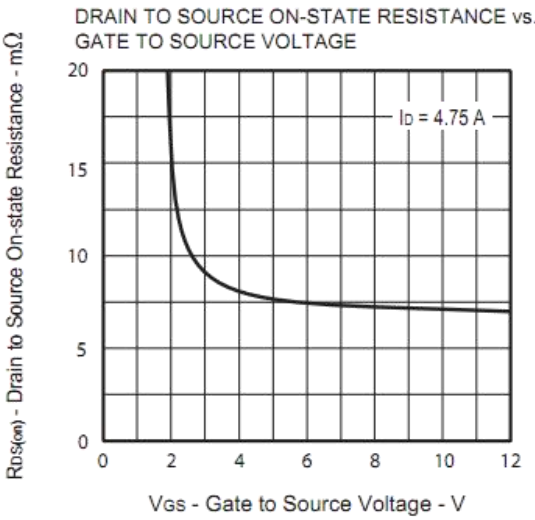
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



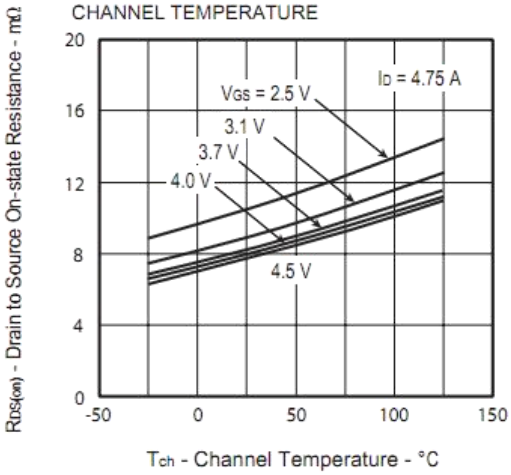
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



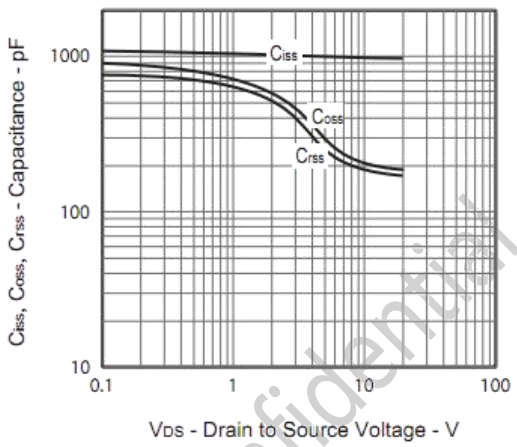
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



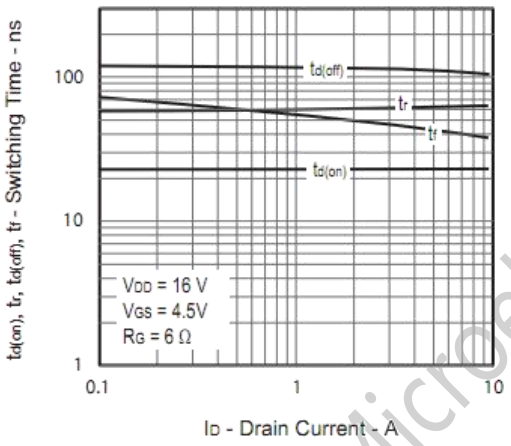
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



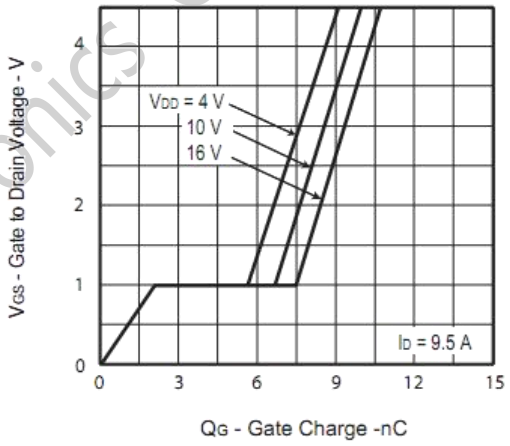
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



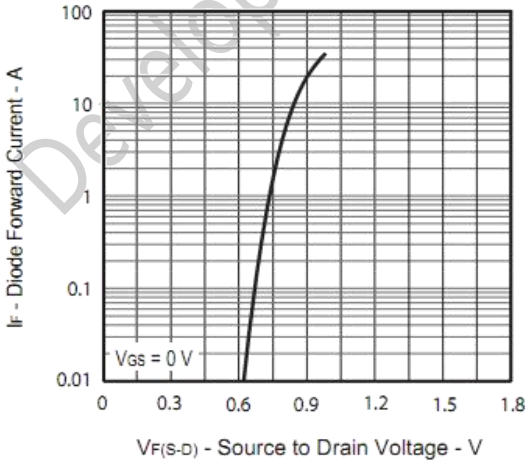
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

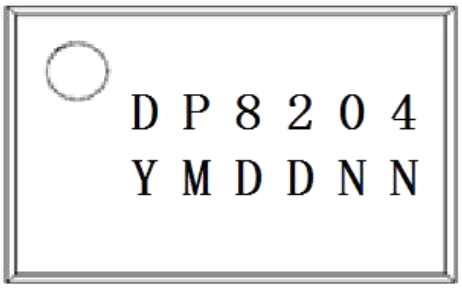


SOURCE TO DRAIN DIODE FORWARD VOLTAGE



MARKING DESCRIPSION

TDFN2X3-6L



NOTE:

Y —Code of productive year code(the last number of the year)

M —Code of productive month(for example: A means January, B means February...)

DD —Productive date(the number of the date)

NN —Lot number of wafer

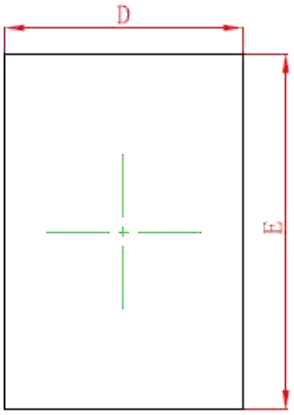
FOR EXCAMPLE:

5G1103

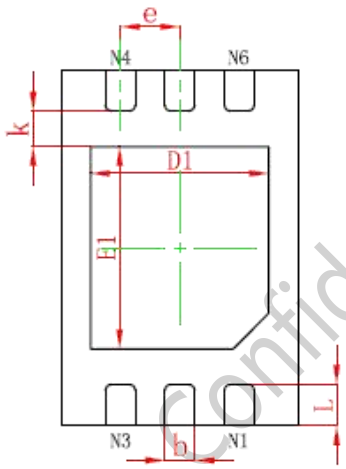
Means this product was produced in 2015-07-11 , and 03 is the wafer lot.

PACKAGE OUTLINE DIMENSIONS

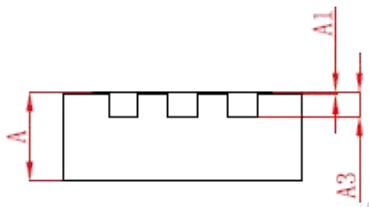
TDFN2X3-6L



TOP VIEW

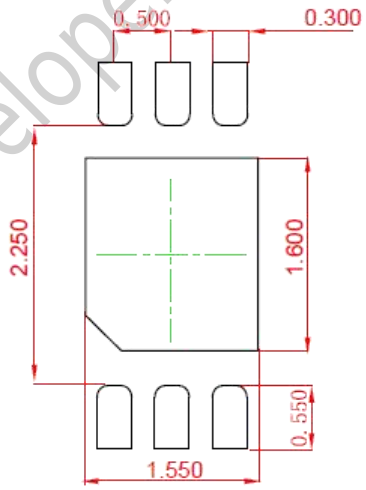


BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.950	2.050	0.077	0.081
E	2.950	3.050	0.116	0.120
D1	1.450	1.550	0.057	0.061
E1	1.650	1.750	0.065	0.069
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.300	0.400	0.012	0.016



Note:
1.Controlling dimension:In millimeters.
2.General tolerance:±0.050mm.
3.The pad layout is for reference purposes only.

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