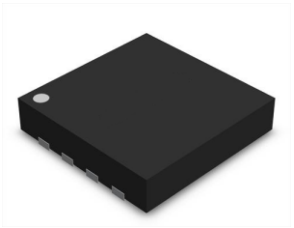
GPAE1604

16V Dual N-Channel MOSFET

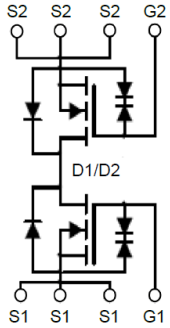
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
16V	3.7mΩ@4.5V	18A
	3.8mΩ@4.0V	
	3.9mΩ@3.8V	
	4.2mΩ@3.1V	
	4.7mΩ@2.5V	

DFN3×3-8L



Schematic diagram



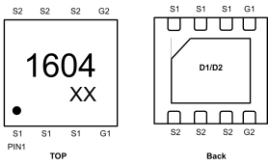
Feature

- Trench Power MOSFET
- Excellent $R_{DS(on)}$
- Low Gate Charge
- ESD Protected

Application

- Load Switch
- Battery Switch

MARKING:



ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	16	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current[1,2]	I_D	18	A
Pulsed Drain Current	I_{DM}	72	A
Power Dissipation	P_D	3	W
Thermal Resistance from Junction to Ambient[1,2]	$R_{\theta JA}$	42	℃/W
Total Power Dissipation	P_D	3	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	16			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 16V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} = ±4.5V, V_{DS} = 0V			±1	μA
		V_{GS} = ±8V, V_{DS} = 0V			±5	μA
On Characteristics						
Gate threshold voltage[3]	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.65	1	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 3A	2.7	3.7	4.7	mΩ
		V_{GS} = 4.0V, I_D = 3A	2.8	3.8	4.8	
		V_{GS} = 3.8V, I_D = 3A	2.9	3.9	4.9	
		V_{GS} = 3.1V, I_D = 3A	3.2	4.2	5.2	
		V_{GS} = 2.5V, I_D = 3A	3.7	4.7	5.9	
Forward tranconductance[3]	g_{FS}	V_{DS} = 5V, I_D = 3A	8			S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 10V,V_{GS} = 0V,f = 1MHz		1950		pF
Output Capacitance	C_{oss}			310		
Reverse Transfer Capacitance	C_{rss}			270		
Switching Characteristics						
Total gate charge	Q_g	V_{DS} = 10V,V_{GS} = 4.5V,I_D = 3A		25		nC
Gate-source charge	Q_{gs}			2.3		
Gate-drain charge	Q_{gd}			7.5		
Turn-on delay time	$t_{d(on)}$	V_{GS} = 5V,V_{DD} = 10V,I_D = 3A R_L = 1.35Ω,R_{GEN} = 3Ω		4.4		ns
Turn-on rise time	t_r			8.7		
Turn-off delay time	$t_{d(off)}$			80		
Turn-off fall time	t_f			23		
Drain-Source Diode Characteristics						
Diode forward current	I_S				18	A
Diode forward voltag[3]	V_{SD}	I_S = 1A, V_{GS} = 0V			1.2	V

Notes :

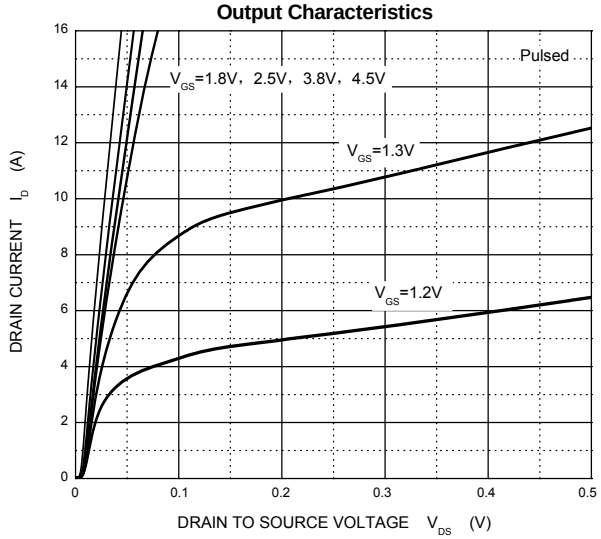
1.$R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR4 board with 1oz. single side copper, in a still air environment with T_A = 25°C.

2. $R_{\theta JA}$ is measured in the steady state

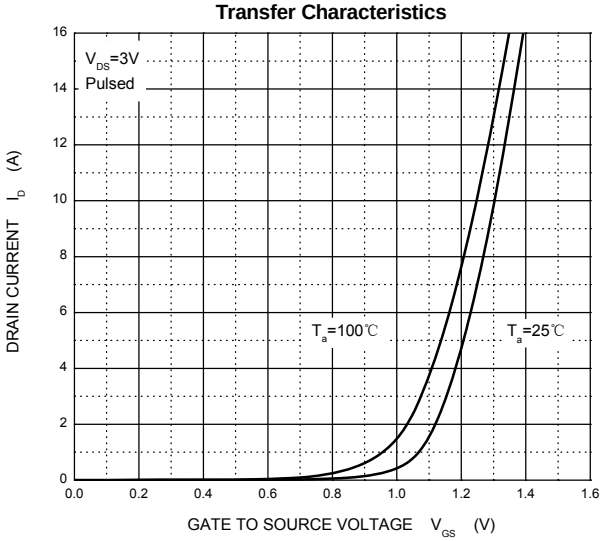
3.Pulse test : Pulse width ≤ 380μs, duty cycle ≤ 2%.

Typical Electrical and Thermal Characteristics

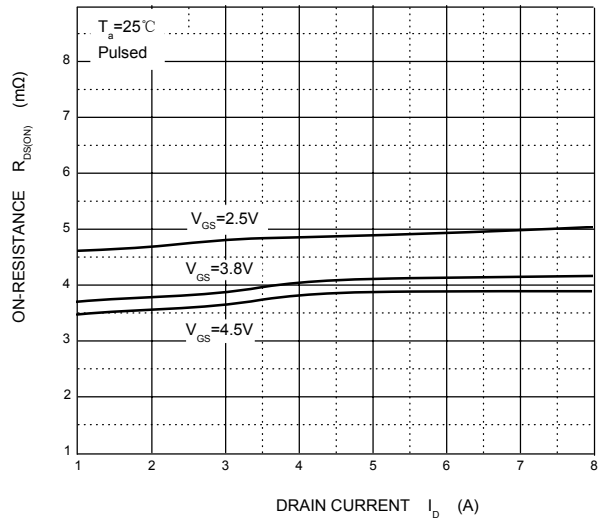
Output Characteristics



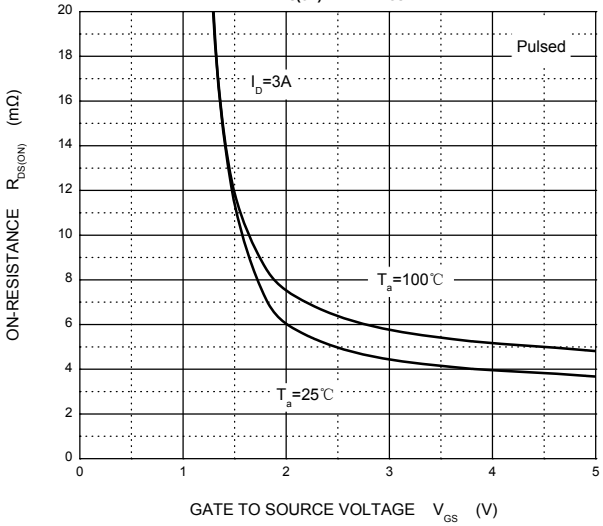
Transfer Characteristics



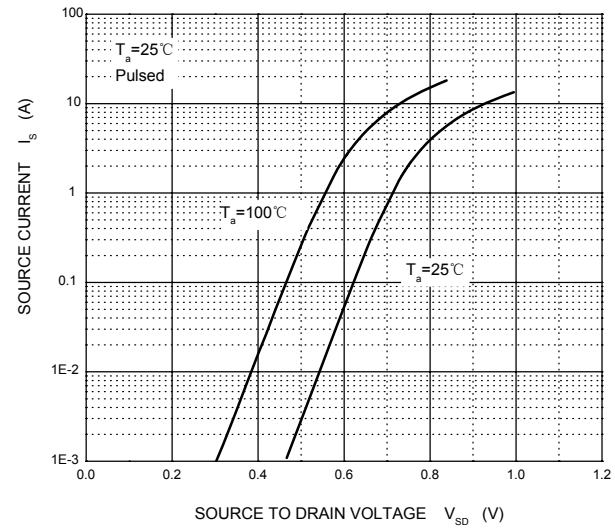
$R_{DS(ON)}$ —— I_D



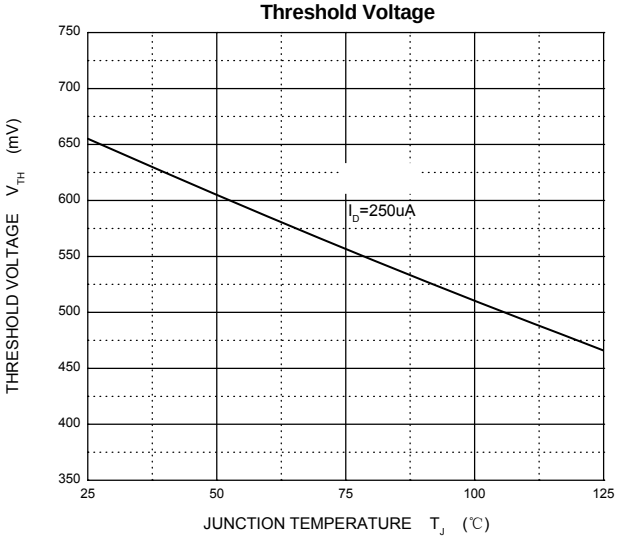
$R_{DS(ON)}$ —— V_{GS}



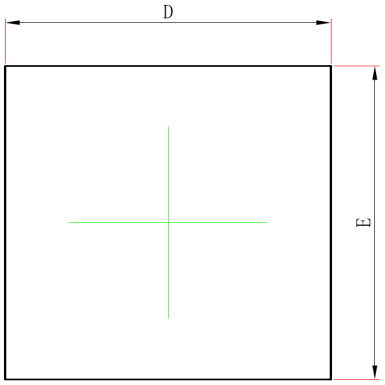
I_S —— V_{SD}



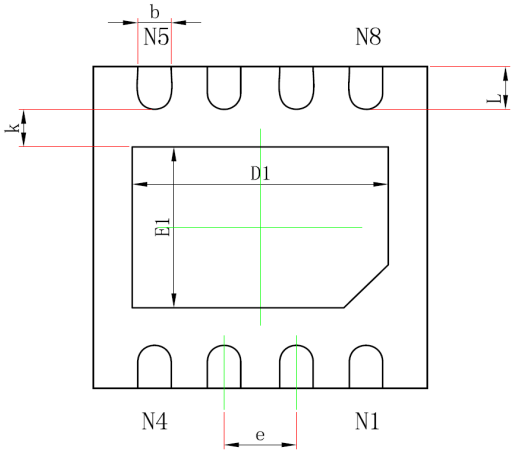
Threshold Voltage



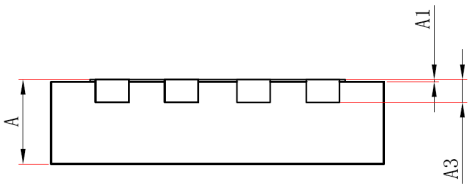
DFN3×3-8L Package Information



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	2.924	3.076	0.115	0.121
E	2.924	3.076	0.115	0.121
D1	2.200	2.400	0.087	0.094
E1	1.400	1.600	0.055	0.063
b	0.250	0.350	0.010	0.014
k	0.200MIN		0.008MIN	
e	0.650TYP.		0.026TYP.	
L	0.324	0.476	0.013	0.019