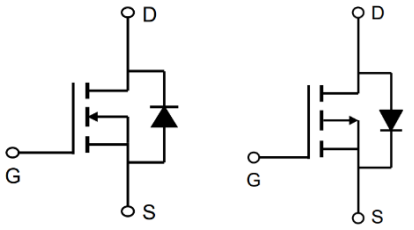
AP8G10NF

100V N+P-Channel Enhancement Mode MOSFET

Description

The AP8G06NF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



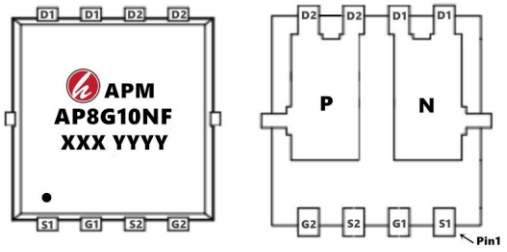
General Features

V_{DS} = 100V I_D =8A

$R_{DS(ON)}$ < 75mΩ @ V_{GS}=10V

V_{DS} = -100V I_D =-6.5A

$R_{DS(ON)}$ < 210mΩ @ V_{GS}=10V

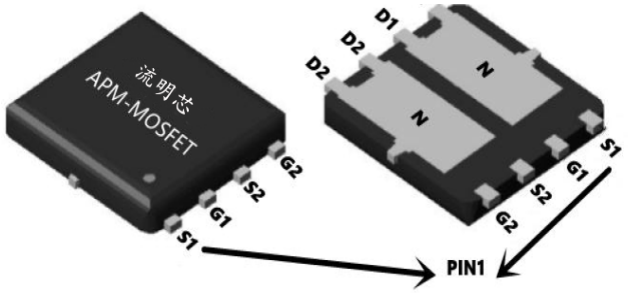


Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP8G10NF	PDFN5*6-8L	AP8G10NF XXX YYYY	5000

Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Parameter	Symbol	N-Channel	P- Channel	Unit
Drain source voltage	VDS	100	-100V	V
Gate source voltage	VGS	±20	±20	V
Continuous drain current[1], T_C=25 ℃	ID	8	-6.5	A
Pulsed drain current[2], T_C=25 ℃	ID, pulse	45	-40	A
Power dissipation[3], T_C=25 ℃	P_D	17	54	W
Single pulsed avalanche energy[4]	EAS	4.2	38	mJ
Operation and storage temperature	Tstg，Tj	-55 to 150		℃
Thermal resistance, junction-case	RθJC	7.4	2.3	℃/W
Thermal resistance, junction-ambient[5]	RθJA	62	62	℃/W

N-Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BVDSS	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	100			V
VGS(th)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	1.0	1.7	3.0	V
RDS(ON)	Drain-source on-state resistance	V_{GS}=10 V, I_D=5 A		55	75	mΩ
RDS(ON)	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=3 A		112	300	mΩ
IGSS	Gate-source leakage current	V_{GS}=±20 V			±100	nA
IDSS	Drain-source leakage current	V_{DS}=100 V, V_{GS}=0 V			200	nA
Ciss	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz		429.4		pF
Coss	Output capacitance			58.3		pF
Crss	Reverse transfer capacitance			2.9		pF
td(on)	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=5 A		15.6		ns
t_r	Rise time			4.2		ns
td(off)	Turn-off delay time			26.8		ns
t_f	Fall time			3.6		ns
Q_g	Total gate charge	I_D=5 A, V_{DS}=50 V, V_{GS}=10 V		7.6		nC
Q_{gs}	Gate-source charge			1.4		nC
Qgd	Gate-drain charge			2.4		nC
Vplateau	Gate plateau voltage			4.5		V
I_S	Diode forward current	VGS<Vth			15	A
ISP	Pulsed source current				45	A
VSD	Diode forward voltage	I_S=7 A, V_{GS}=0 V			1.3	V
trr	Reverse recovery time	I_S=5 A, di/dt=100 A/μs		36.1		ns
Q_{rr}	Reverse recovery charge			50.4		nC
Irrm	Peak reverse recovery current			2.6		A

Note

1、Calculated continuous current based on maximum allowable junction temperature.

2、Repetitive rating; pulse width limited by max. junction temperature.

3、Pd is based on max. junction temperature, using junction-case thermal resistance.

4、V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 °C.

5、The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

P-Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-to-Source breakdown voltage	V_{GS} = 0V, I_D = -250μA	-100	—	—	V
$R_{DS(on)}$	Static Drain-to-Source on-resistance	V_{GS}=-10V,I_D =-5A	—	170	210	mΩ
		V_{GS}=- 4.5V,I_D =-2A	—	190	230	
VGS(th)	Gate threshold voltage	V_{DS} = V_{GS}, I_D =- 250μA	-1	—	-3	V
IDSS	Drain-to-Source leakage current	V_{DS} =-100V,V_{GS} = 0V	—	—	-1	μA
IGSS	Gate-to-Source forward leakage	V_{GS} =30V	—	—	100	nA
		V_{GS} = -30V	—	—	-100	
Q_g	Total gate charge	I_D = -5A, V_{DS}=-80V, V_{GS} = -10V	—	20	—	nC
Q_{gs}	Gate-to-Source charge		—	3.5	—	
Q_{gd}	Gate-to-Drain("Miller") charge		—	4.6	—	
$t_{d(on)}$	Turn-on delay time	V_{GS}=-10V, V_{DS}=-50V, R_{GEN}=25Ω I_D=-5A	—	18	—	ns
t_r	Rise time		—	8	—	
$t_{d(off)}$	Turn-Off delay time		—	100	—	
t_f	Fall time		—	30	—	
C_{iss}	Input capacitance	V_{GS} = 0V V_{DS} = -25V f = 1MHz	—	1419	—	pF
Coss	Output capacitance		—	89	—	
C_{rss}	Reverse transfer capacitance		—	45	—	
I_S	Continuous Source Current (Body Diode)	MOSFET symbol showing the integral reverse p-n junction diode.	—	—	-10	A
ISM	Pulsed Source Current (Body Diode)		—	—	-20	A
V_{SD}	Diode Forward Voltage	I_S=-1A, V_{GS}=0V	—	—	-1.2	V
t_{rr}	Reverse Recovery Time	T_J = 25°C, I_F =-5A, di/dt = 100A/μs	—	27	—	nS
Q_{rr}	Reverse Recovery Charge		—	24	—	nC

Notes:
1、Calculated continuous current based on maximum allowable junction temperature.
2、Repetitive rating; pulse width limited by max. junction temperature.
3、The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
4、The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

N-Electrical Characteristics Diagrams

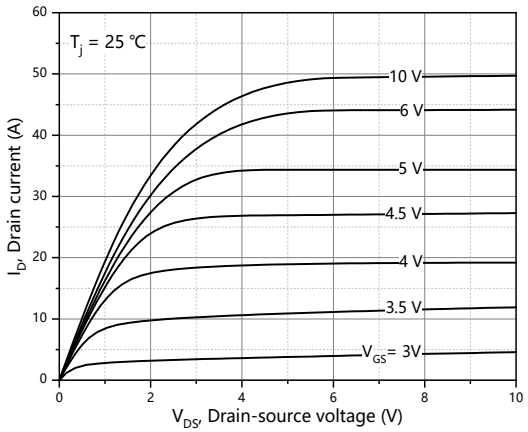


Figure 1, Typ. output characteristics

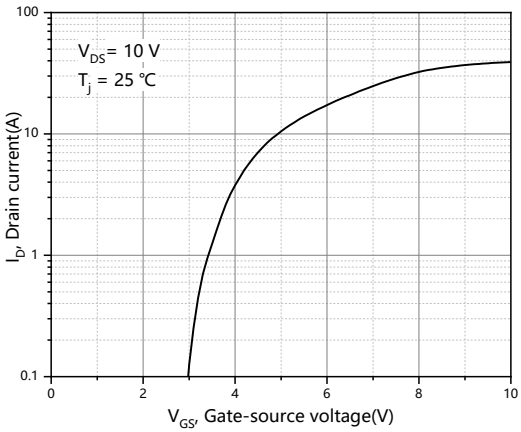


Figure 2, Typ. transfer characteristics

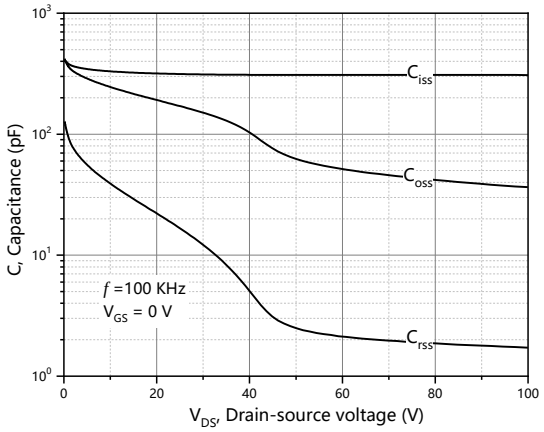


Figure 3, Typ. capacitances

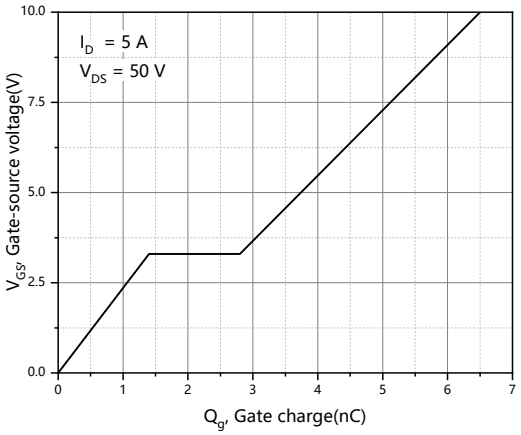


Figure 4, Typ. gate charge

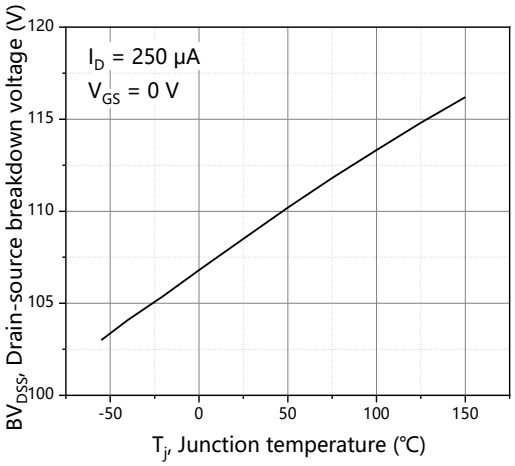


Figure 5, Drain-source breakdown voltage

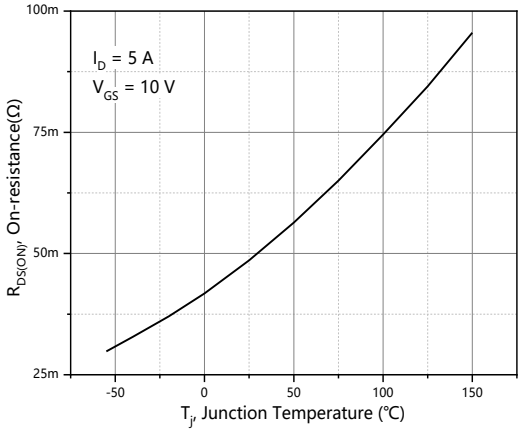


Figure 6, Drain-source on-state resistance

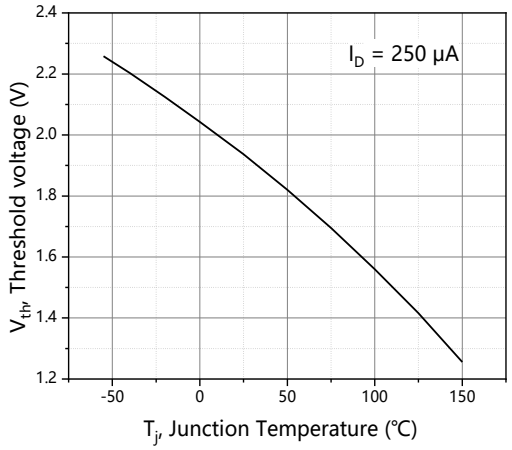


Figure 7, Threshold voltage

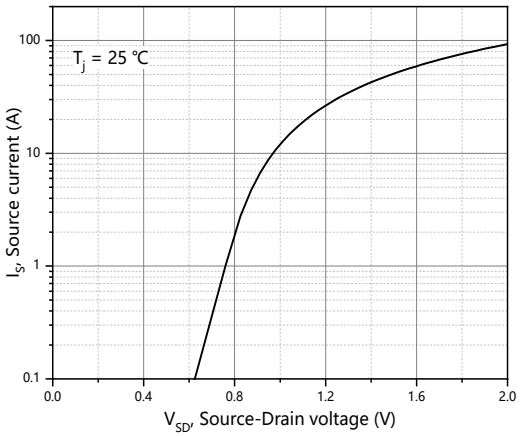


Figure 8, Forward characteristic of body diode

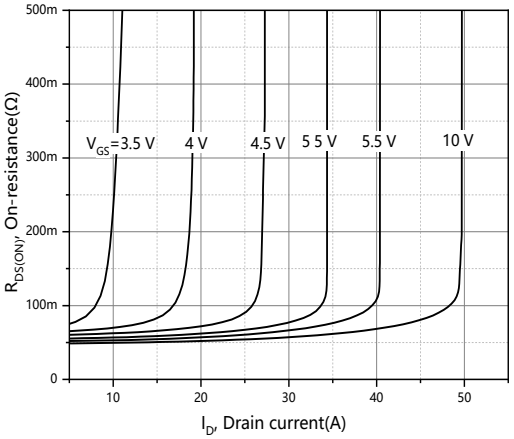


Figure 9, Drain-source on-state resistance

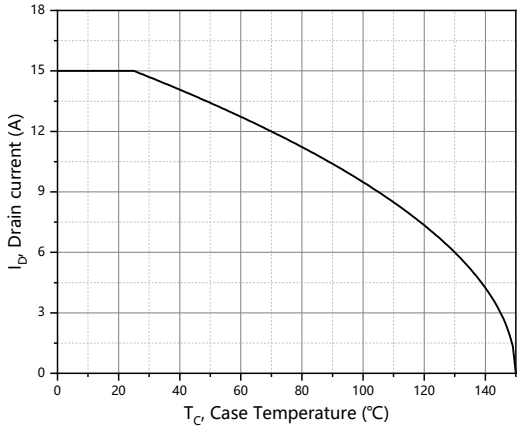


Figure 10, Drain current

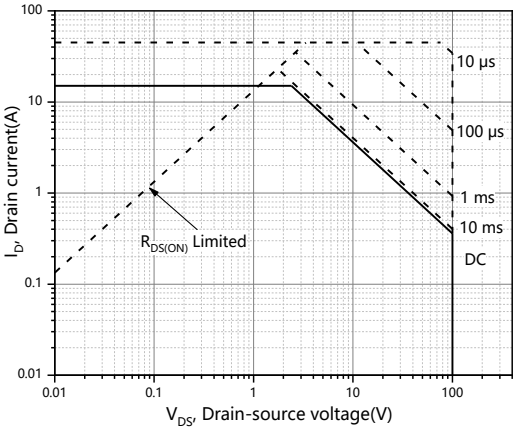


Figure 11, Safe operation area T_C=25 ℃

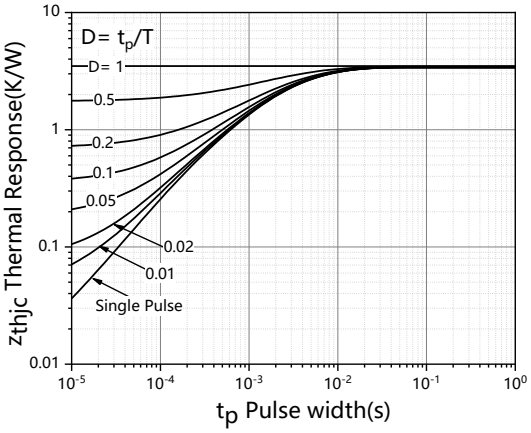


Figure 12, Max. transient thermal impedance

P-Electrical Characteristics Diagrams

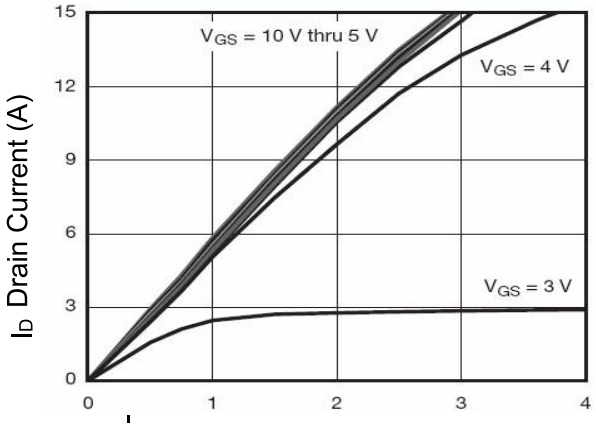


Figure 1 Output Characteristics

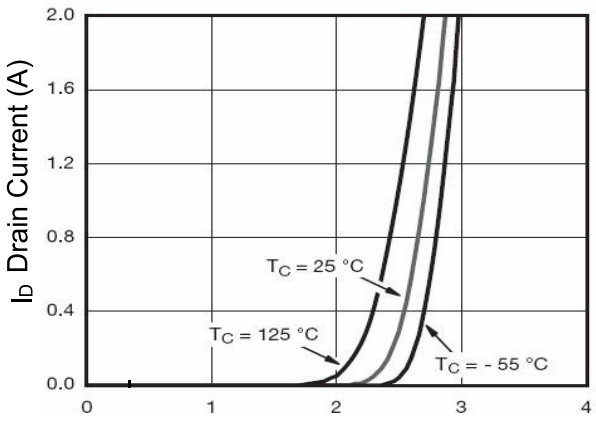


Figure 2 Transfer Characteristics

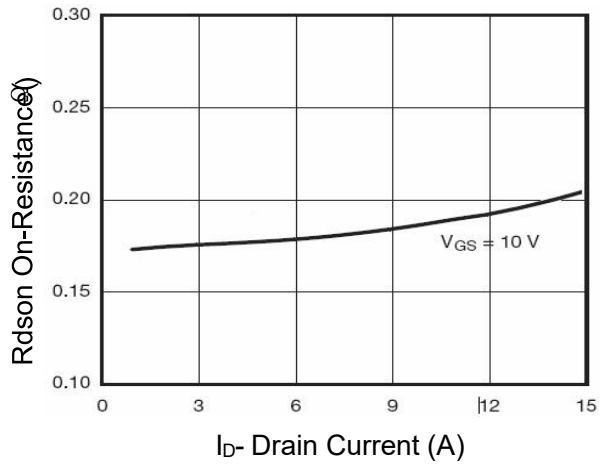


Figure 3 Rdson-Drain Current

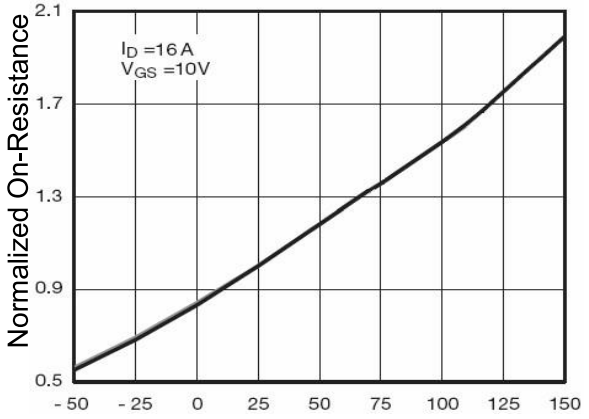


Figure 4 Rdson-JunctionTemperature

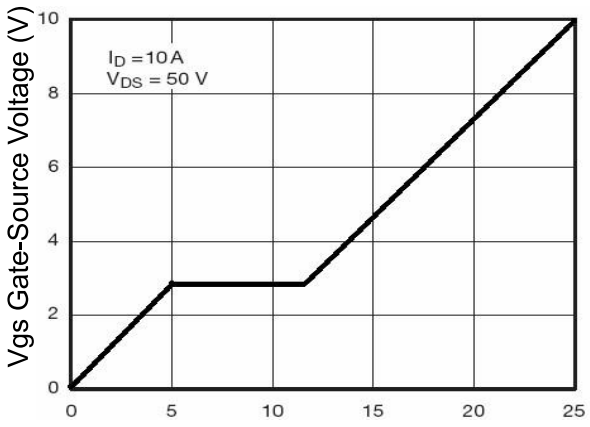


Figure 5 Gate Charge

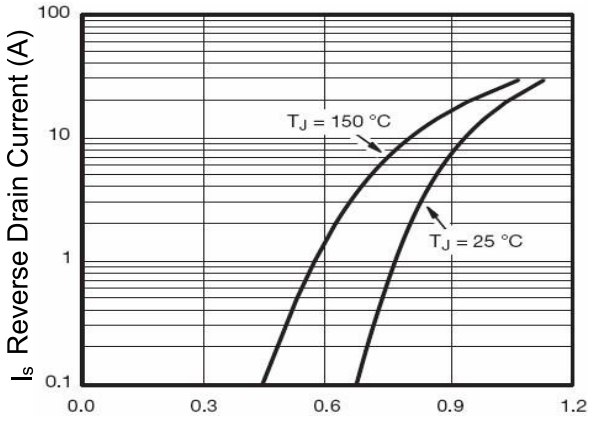


Figure 6 Source- Drain Diode Forward

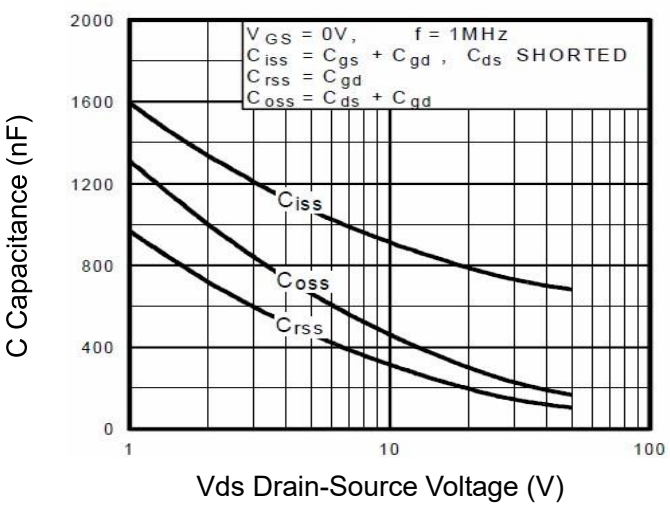


Figure 7 Capacitance vs Vds

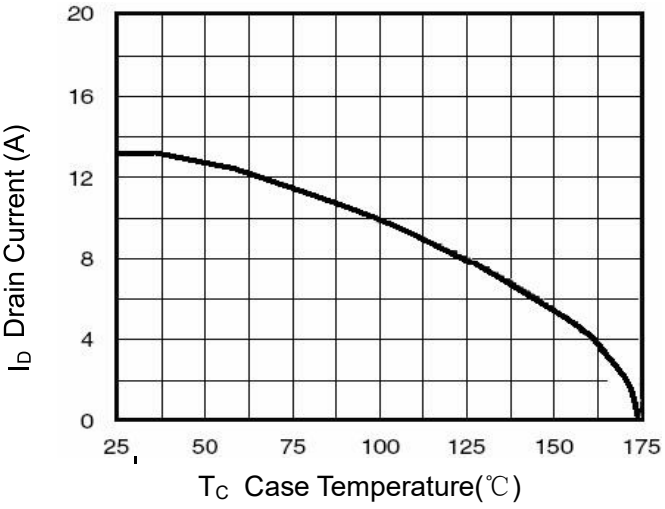


Figure 9 Drain Current vs Case Temperature

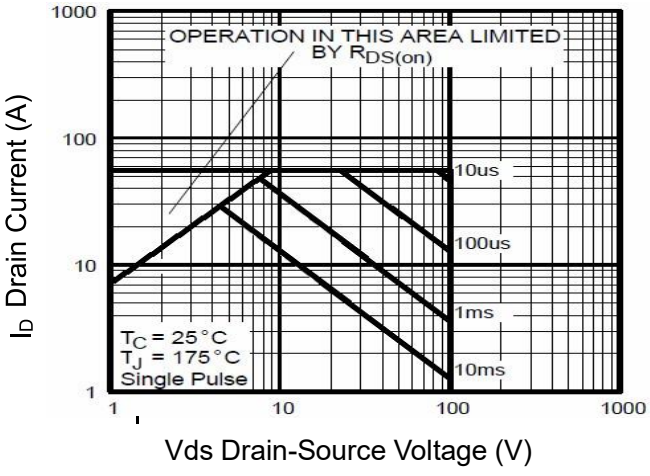


Figure 8 Safe Operation Area

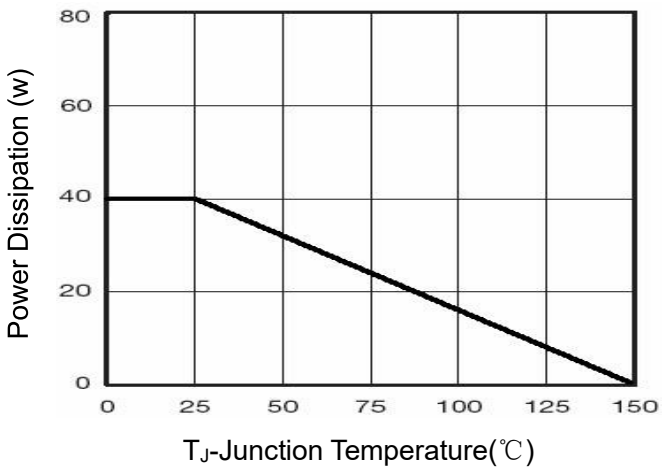


Figure 10 Power De-rating

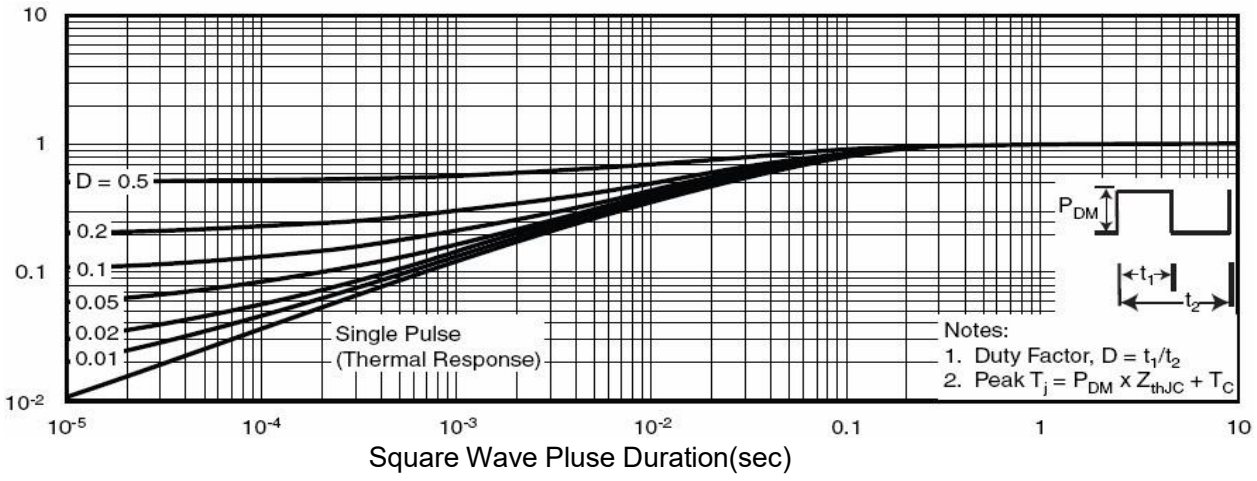
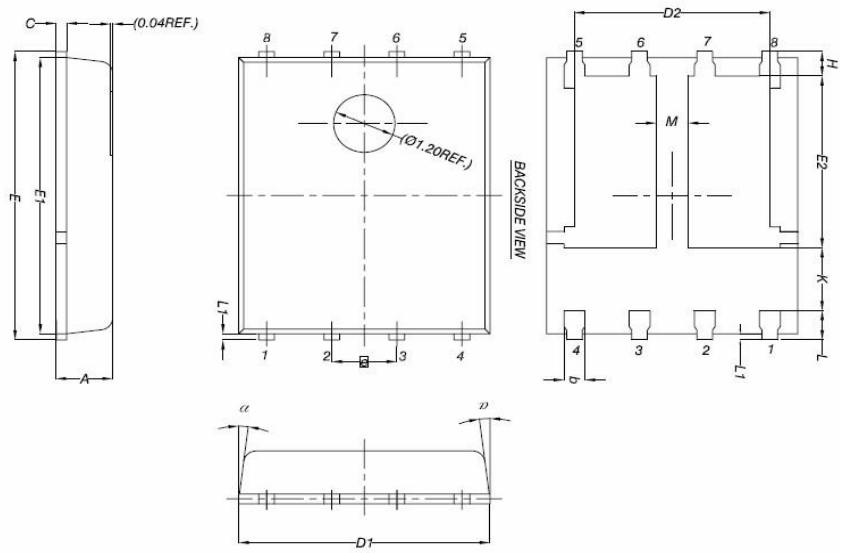


Figure 11 Normalized Maximum Transient Thermal

Package Mechanical Data-DFN5*6-8L-JQ Double



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.66	5.76	5.83
E2	3.37	3.47	3.58
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°

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Edition	Date	Change
Rve1.0	2019/5/31	Initial release