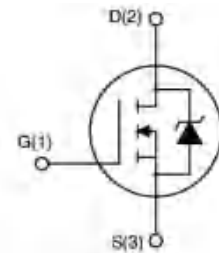


APG068N04G

N-Channel Enhancement Mosfet

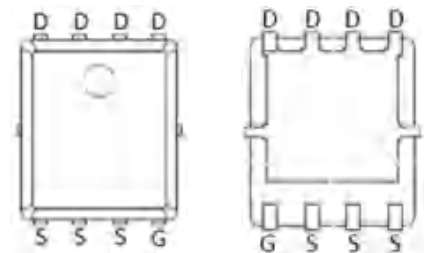
Feature

- 40V,50A
 $R_{DS(ON)} < 6.8m\Omega @ V_{GS}=10V$ (TYP:5.7m Ω)
 $R_{DS(ON)} < 10m\Omega @ V_{GS}=4.5V$ (TYP:7.5m Ω)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- PWM applications
- Load Switch
- Power management



PDFN5X6-8L

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G068N04G	APG068N04G	PDFN5X6-8L	13 inch	-	5000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c = 25^\circ\text{C}$)	I_D	50	A
Continuous Drain Current ($T_c = 100^\circ\text{C}$)	I_D	32	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	200	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	46	mJ
Power Dissipation	P_D	34	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.7	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

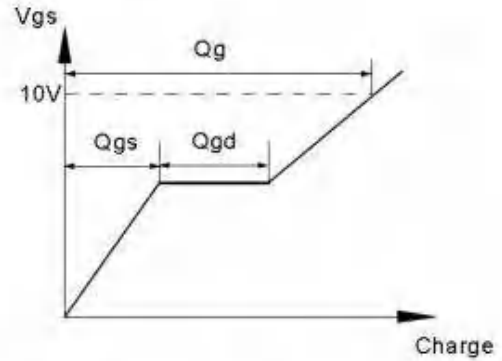
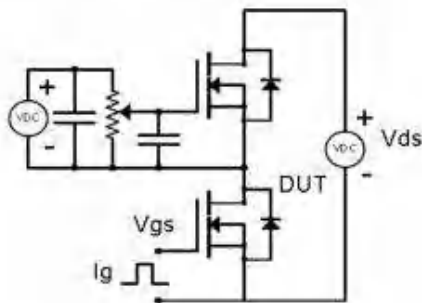
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.6	2.0	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	5.7	6.8	m Ω
		$V_{GS} = 4.5V, I_D = 15A$	-	8.5	10	
Gate Resistance	R_g	$V_{DS} = V_{GS} = 0V, f = 1MHz$	-	3.6	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$	-	840	-	pF
Output Capacitance	C_{oss}		-	320	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, R_L = 1\Omega, V_{GS} = 10V, R_G = 1.6\Omega$	-	5.5	-	ns
Turn-on rise time	t_r		-	50	-	
Turn-off delay time	$t_{d(off)}$		-	18	-	
Turn-off fall time	t_f		-	5.5	-	
Total Gate Charge	Q_g	$V_{DS} = 20V, I_D = 20A, V_{GS} = 10V$	-	13.1	-	nC
Gate-Source Charge	Q_{gs}		-	2.2	-	
Gate-Drain Charge	Q_{gd}		-	2.6	-	
Reverse Recovery Chrage	Q_{rr}	$I_F = 20A, di/dt = 100A/us$		15		nC
Reverse Recovery Time	T_{rr}	$I_F = 20A, di/dt = 100A/us$		29		ns
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V_{DS}	$V_{GS} = 0V, I_S = 20A$	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I_S		-	-	50	A

Notes:

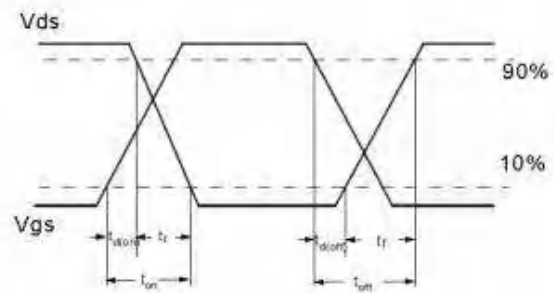
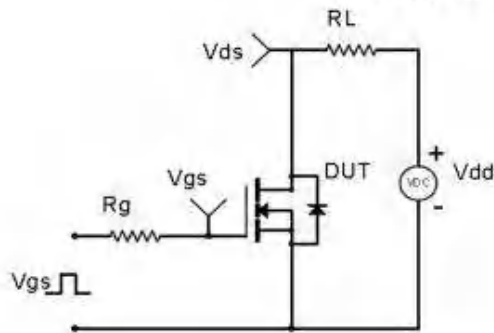
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^{\circ}\text{C}, V_{DD} = 20V, R_G = 25\Omega, L = 0.5mH$
3. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
4. Surface Mounted on FR4 Board, $t \leq 10\text{ sec}$

Test Circuit & Waveform

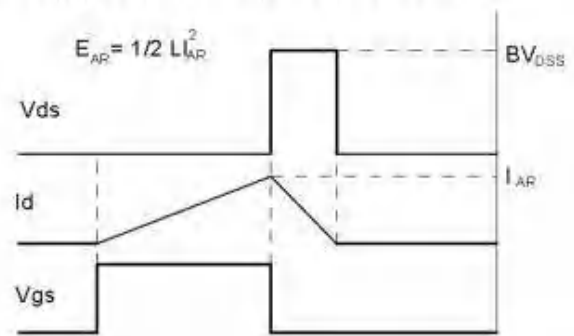
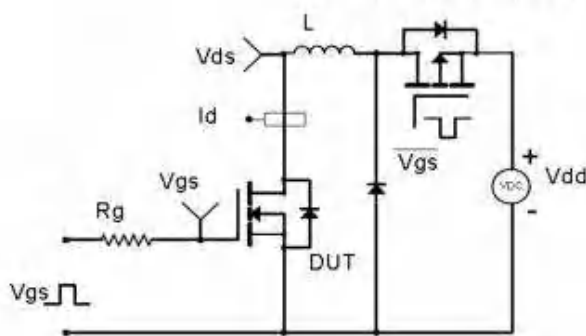
Gate Charge Test Circuit & Waveform



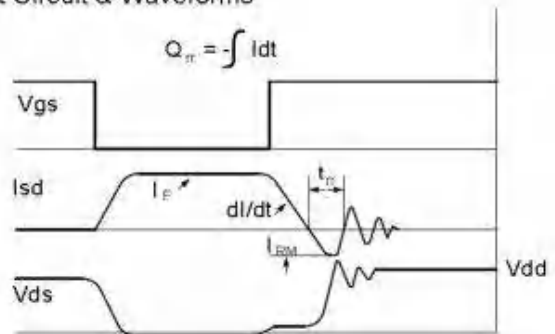
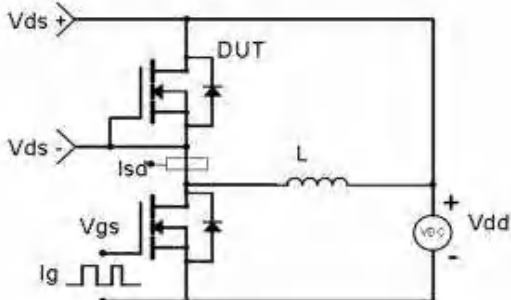
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Electrical Characteristics Diagrams

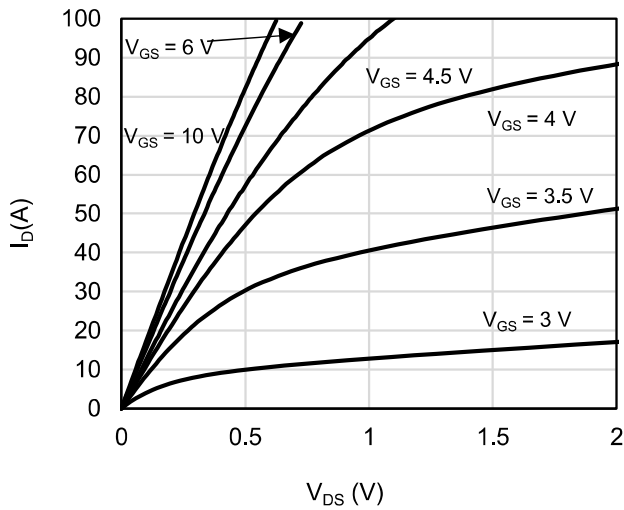


Figure 1: On-Region Characteristics

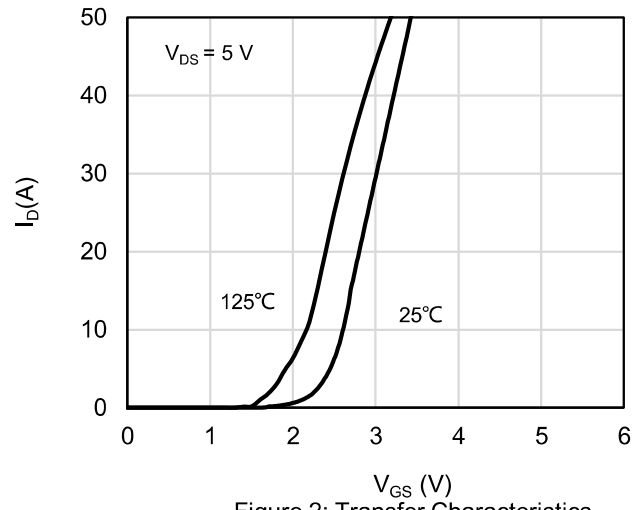


Figure 2: Transfer Characteristics

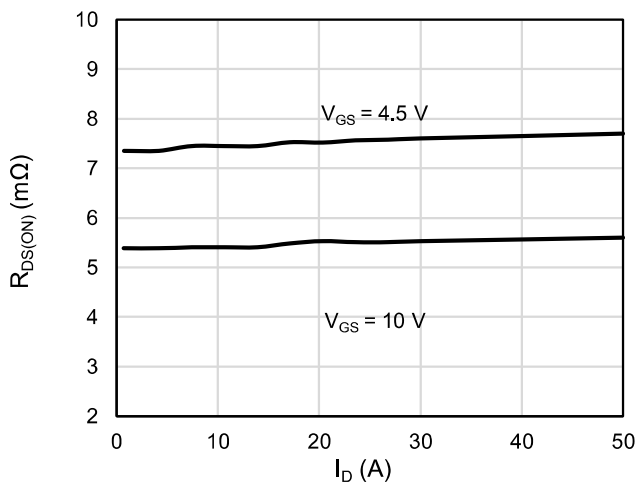


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

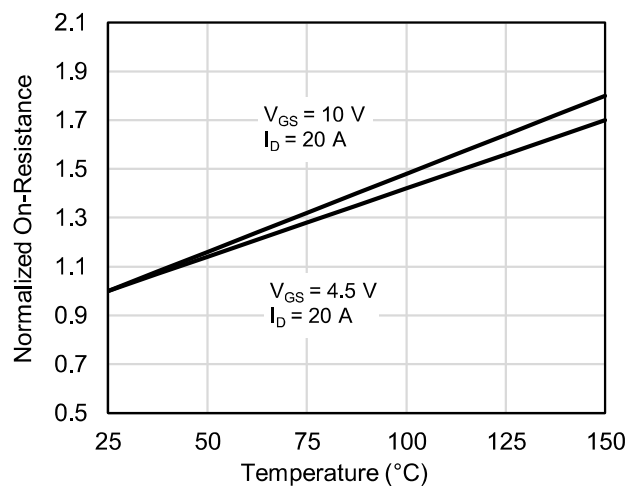


Figure 4: On-Resistance vs. Junction Temperature

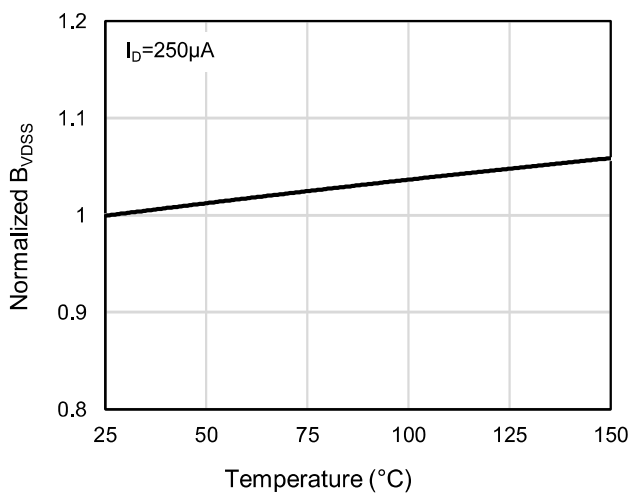


Figure 5: Breakdown Voltage vs. Junction Temperature

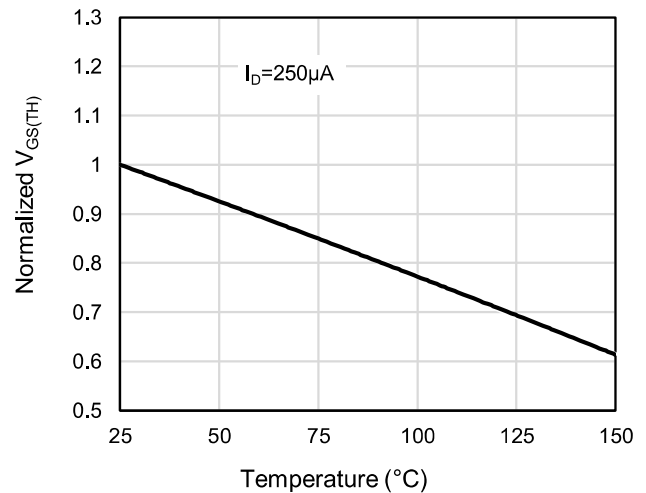


Figure 6: Threshold Voltage vs. Junction Temperature

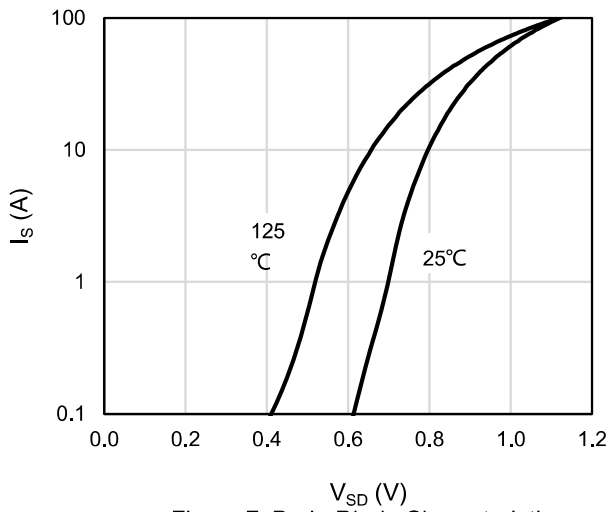


Figure 7: Body-Diode Characteristics

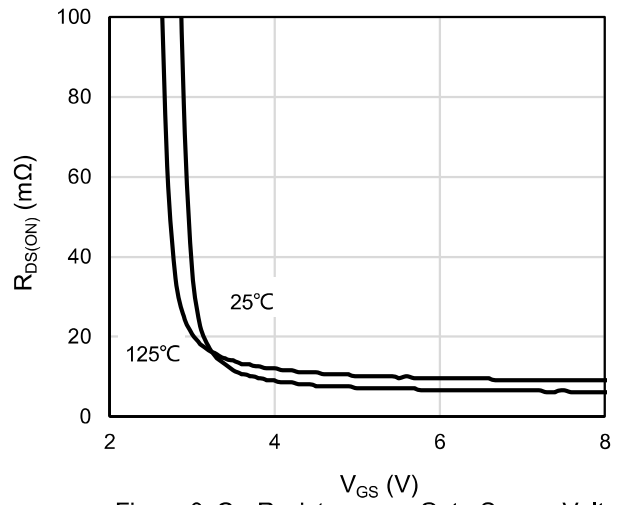


Figure 8: On-Resistance vs. Gate-Source Voltage

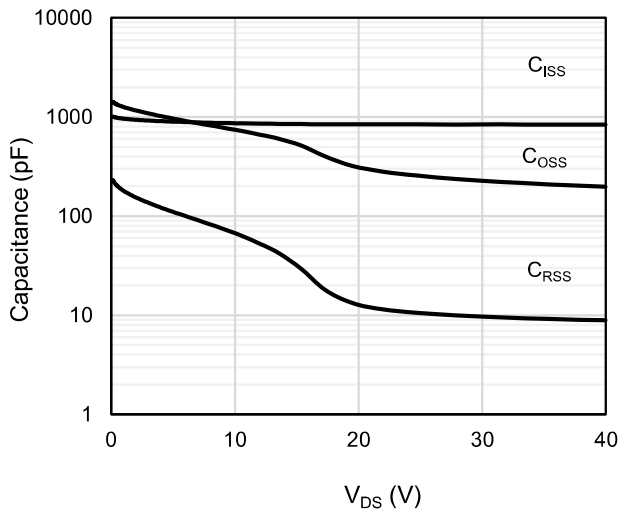


Figure 9: Capacitance Characteristics

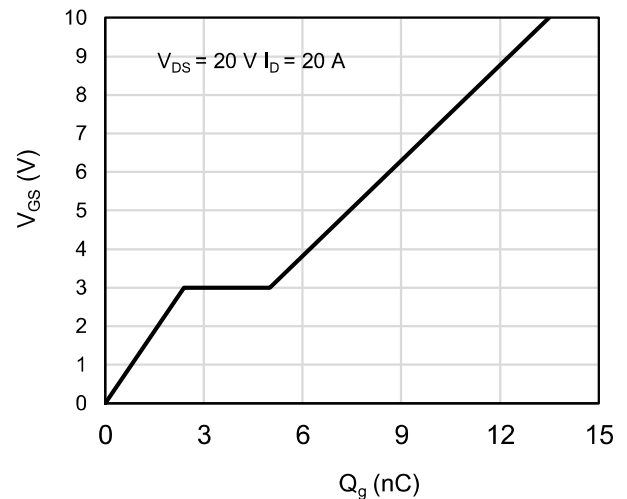


Figure 10: Gate-Charge Characteristics

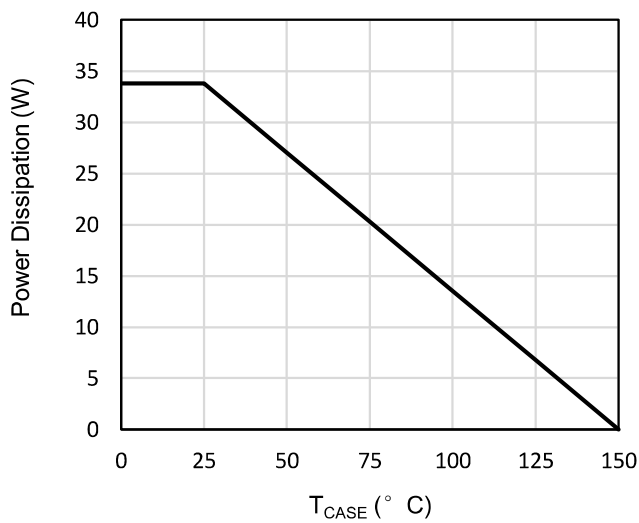


Figure 11: Power De-rating

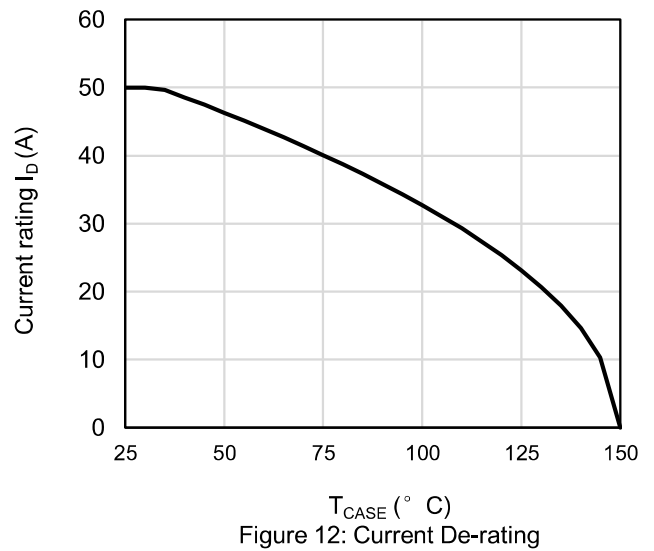
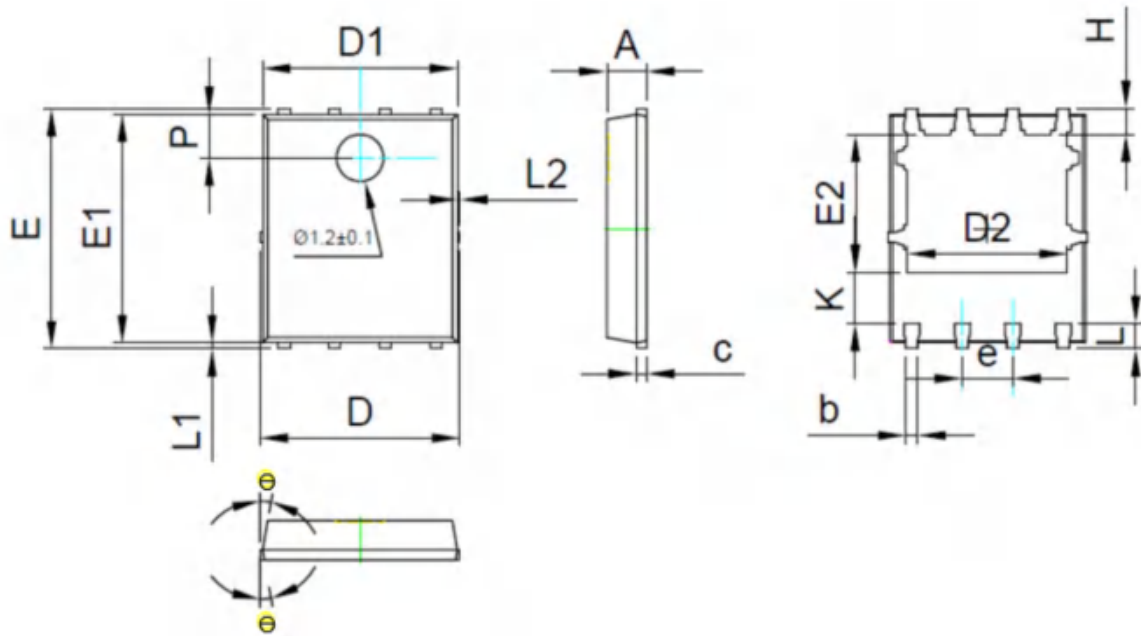


Figure 12: Current De-rating

PDFN5X6-8L Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	-	-	5.1
D1	4.85	4.90	4.95
D2	3.96	4.01	4.06
e	1.27 BSC		
E	5.95	6.00	6.05
E1	5.70	5.75	5.80
E2	3.425	3.475	3.525
H	0.60	0.65	0.70
K	1.29	-	-
L	0.60	0.65	0.70
L1	0.05	0.15	0.25
L2	-	-	0.12
θ	8°	10°	12°
P	1.05	1.10	1.15