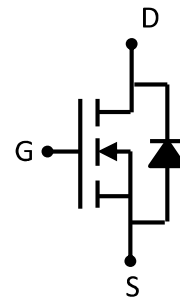


## Feature

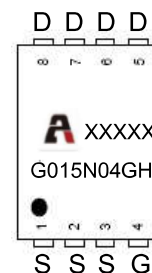
- 40V,200A  
 $R_{DS(ON)} < 1.5m\Omega @ V_{GS}=10V$  TYP:  $1.2m\Omega$
- Split Gate Trench Technology
- Provide Excellent  $R_{DS(ON)}$  And Low Gate Charge
- RoHS and Halogen-Free Compliant



Schematic diagram

## Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Marking and pin assignment

## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G015N04GH	APG015N04GH	PDFN5X6	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	$V_{GS}$	$\pm 20$	V
Drain Current(Silicon limited)	$I_D$	200	A
Continuous Drain Current ( $T_c = 25^\circ\text{C}$ )	$I_D$	130	A
Continuous Drain Current ( $T_c = 100^\circ\text{C}$ )	$I_D$	82	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	390	A
Single Pulsed Avalanche Energy <sup>(2)</sup>	$E_{AS}$	450	mJ
Power Dissipation	$P_D$	114	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.1	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	20	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

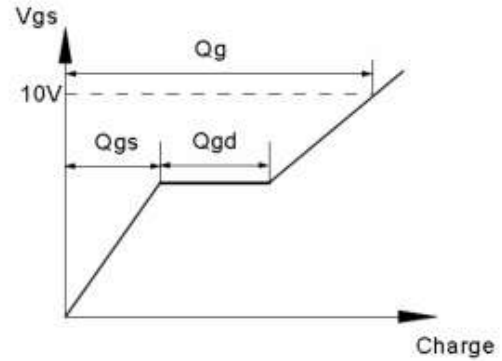
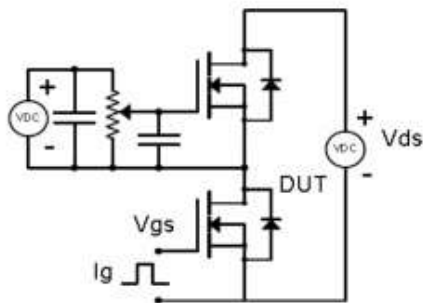
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>(3)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	2.8	4	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	1.2	1.5	mΩ
Gate Resistance	R <sub>G</sub>	f =1MHz	-	2.7	-	Ω
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =300KHz	-	9300	-	pF
Output Capacitance	C <sub>oss</sub>		-	1410	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	78	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =20V, I <sub>D</sub> =25A, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	-	22	-	ns
Turn-on rise time	t <sub>r</sub>		-	6.8	-	
Turn-off delay time	t <sub>d(off)</sub>		-	80	-	
Turn-off fall time	t <sub>f</sub>		-	27	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =32V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	-	127	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	35	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	26	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	V <sub>DS</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	-	1.2	V
Diode Forward current <sup>(4)</sup>	I <sub>S</sub>		-	-	100	A
Reverse recovery time	T <sub>rr</sub>	I <sub>S</sub> =25A, V <sub>GS</sub> =0V, dI <sub>F</sub> /dt=100A/us		100		ns
Reverse recovery charge	Q <sub>rr</sub>	I <sub>S</sub> =25A, V <sub>GS</sub> =0V, dI <sub>F</sub> /dt=100A/us		163		nC

**Notes:**

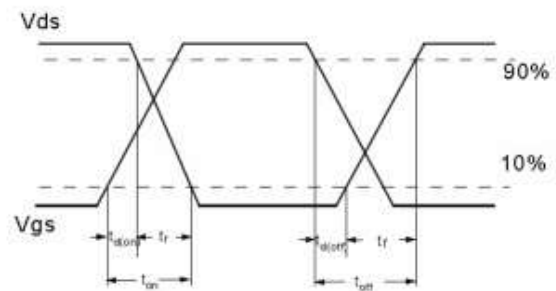
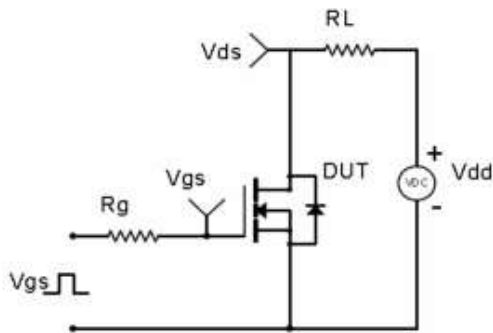
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=32V, R<sub>G</sub>=25 Ω, L=0.5mH
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board, t≤10 sec

**Test Circuit & Waveform**

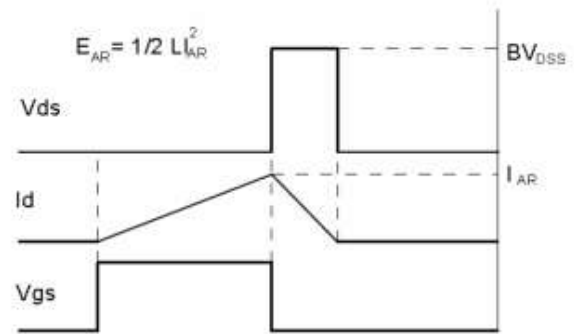
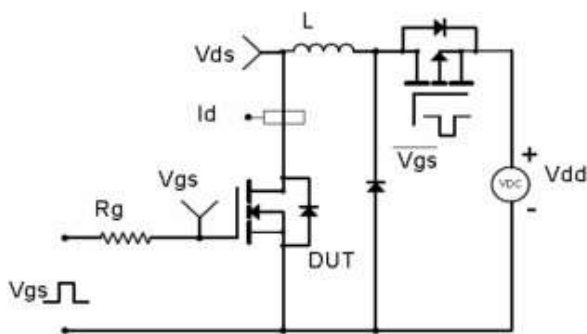
Gate Charge Test Circuit & Waveform



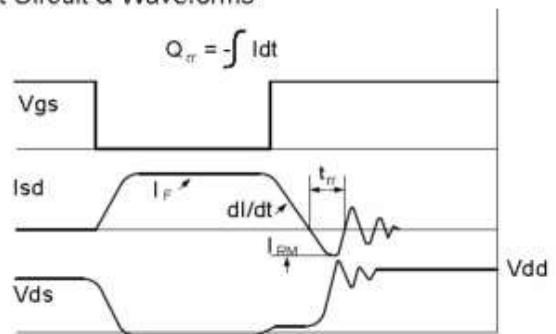
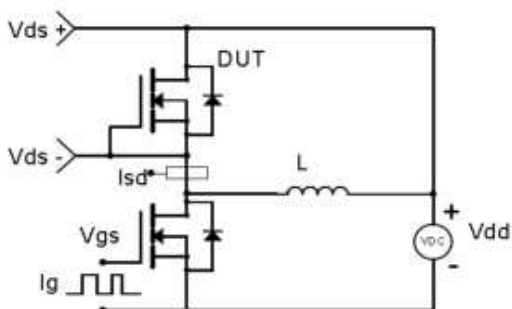
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



**Typical Performance Characteristics**

Figure.1 Typical Output Characteristics

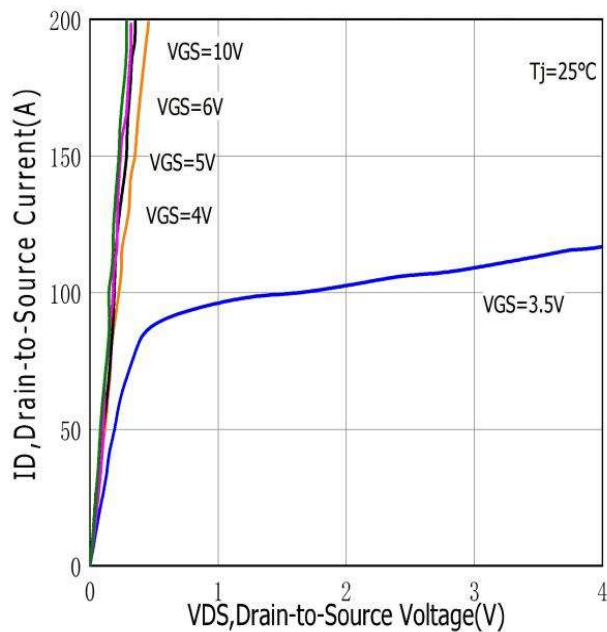


Figure.2 Typical Gate Charge vs Gate to Source Voltage

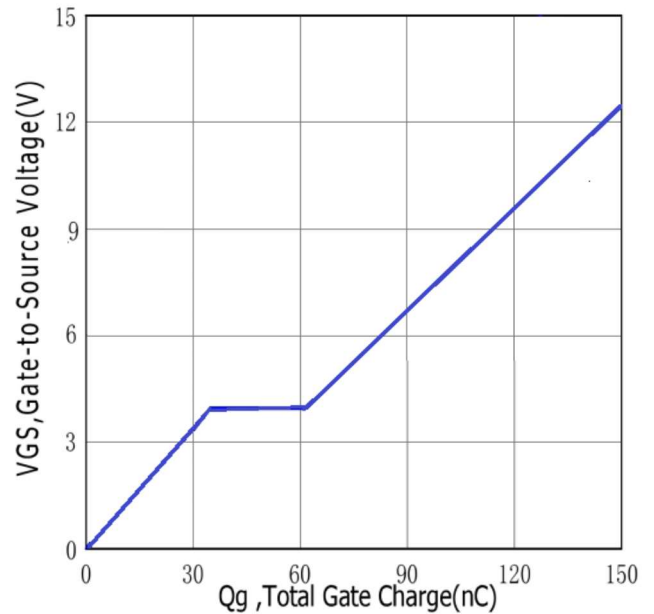


Figure.3 Typical Body Diode Transfer Characteristics

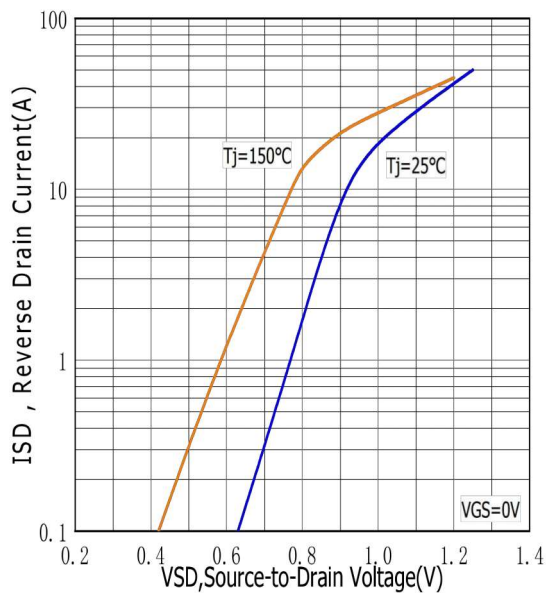
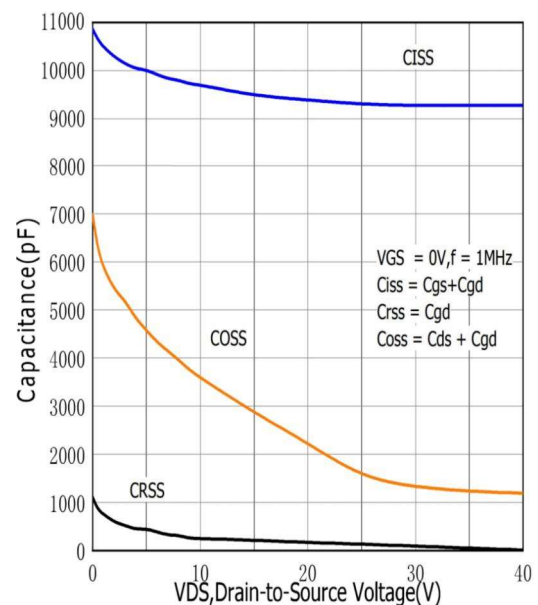


Figure.4 Typical Capacitance vs Drain to Source Voltage



**Typical Performance Characteristics**

Figure.5 Typical Breakdown Voltage vs Junction Temperature

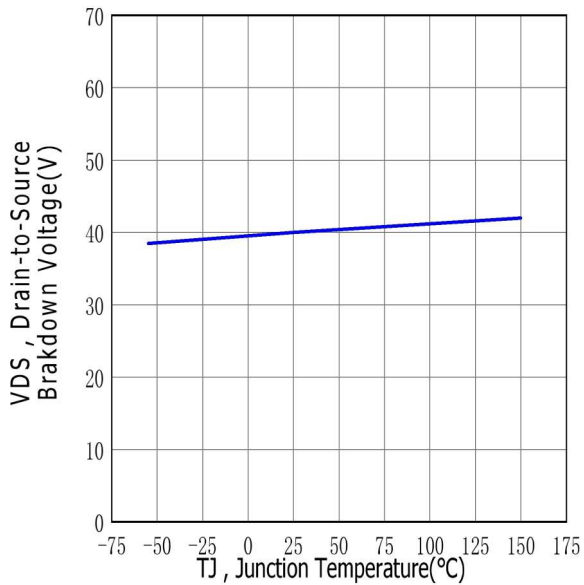


Figure.6 Typical Drain to Source on Resistance vs Junction Temperature

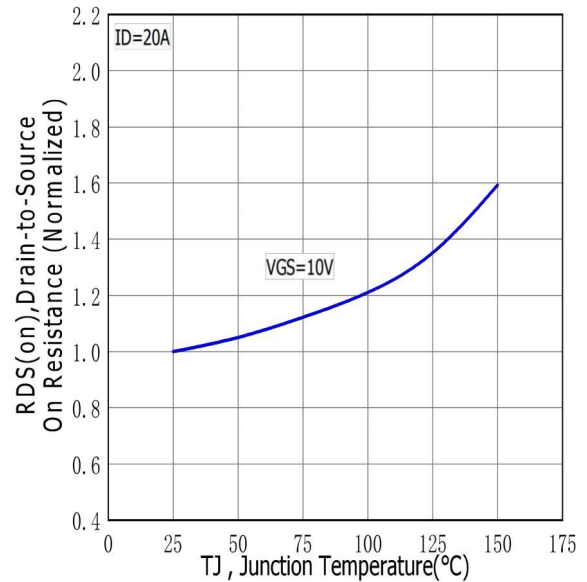


Figure.7 Maximum Forward Bias Safe Operating Area

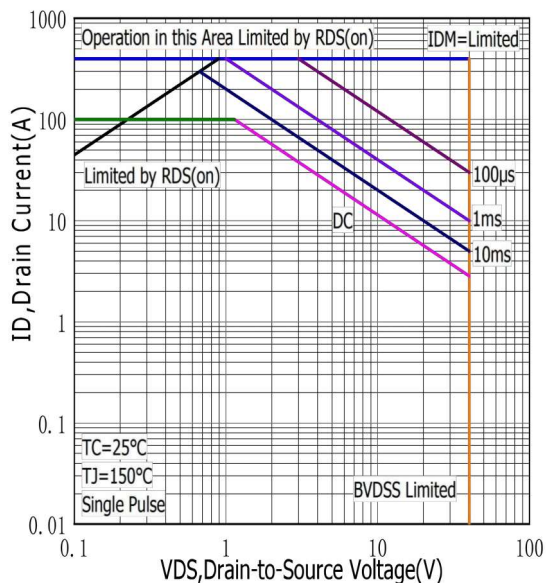
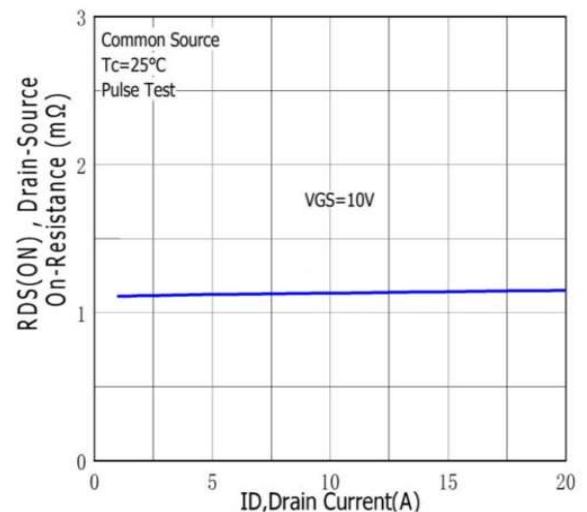


Figure.8 Typical Drain to Source ON Resistance vs Drain Current



**Typical Performance Characteristics**

Figure.9 Maximum EAS vs Channel Temperature

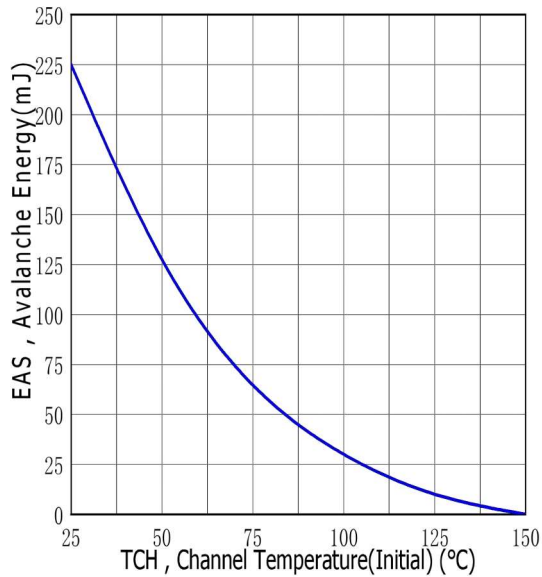


Figure.10 Typical Threshold Voltage vs Case Temperature

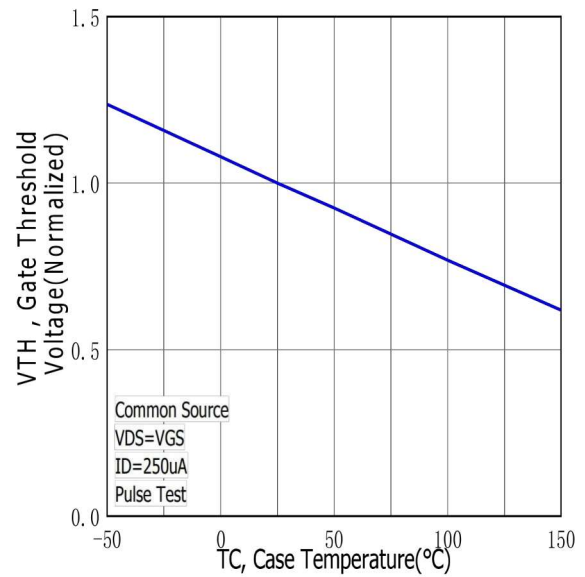


Figure.11 Typical Transfer Characteristics

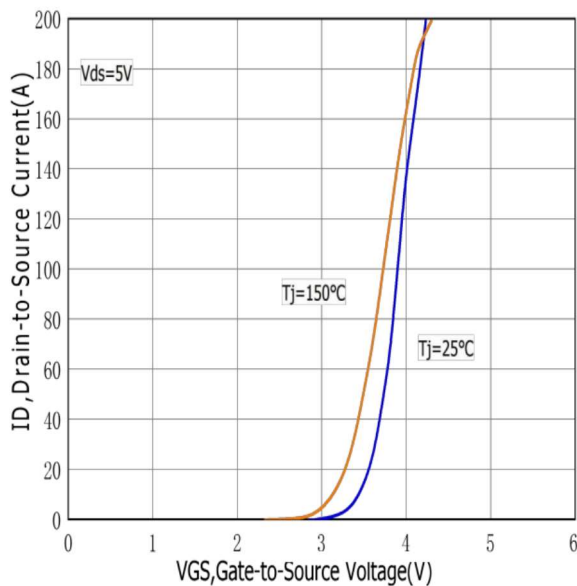
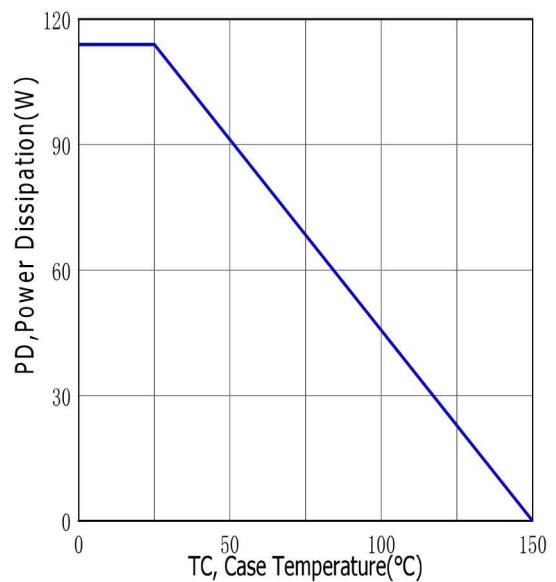
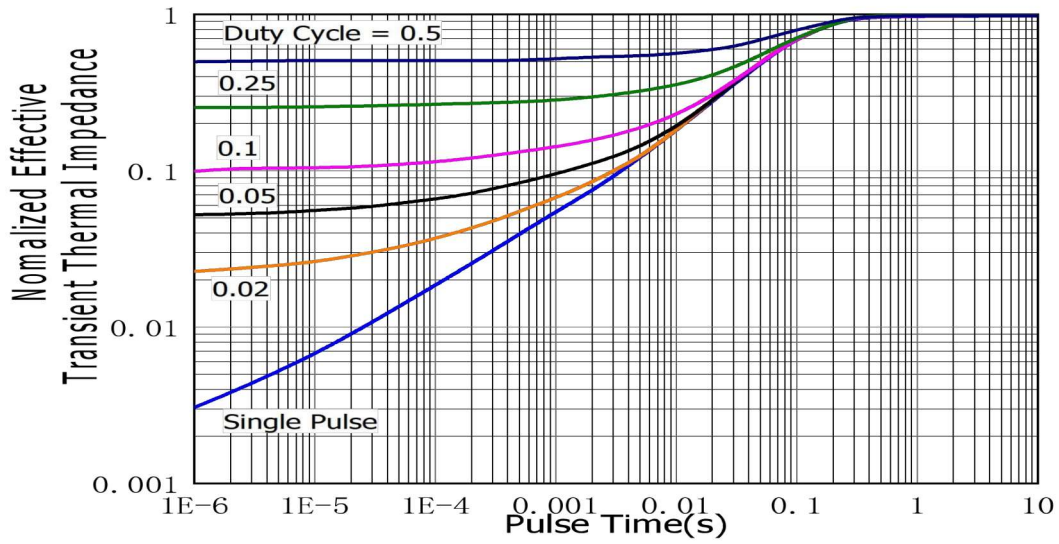


Figure.12 Maximum Power Dissipation vs Case Temperature

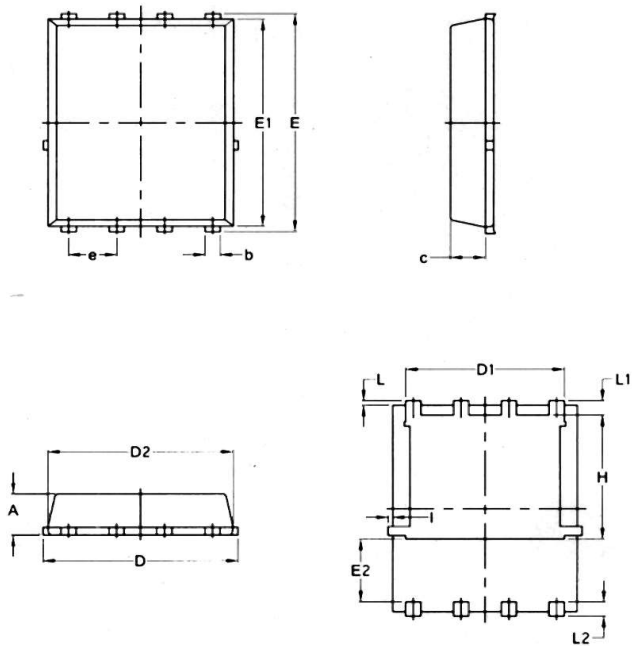


**Typical Performance Characteristics**

Figure.13 Maximum Effective Thermal Impedance , Junction to Case



**PDFN5X6 Package Information**



PDFN5X6

SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	—	0.0630	—
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	—	0.18	—	0.0070