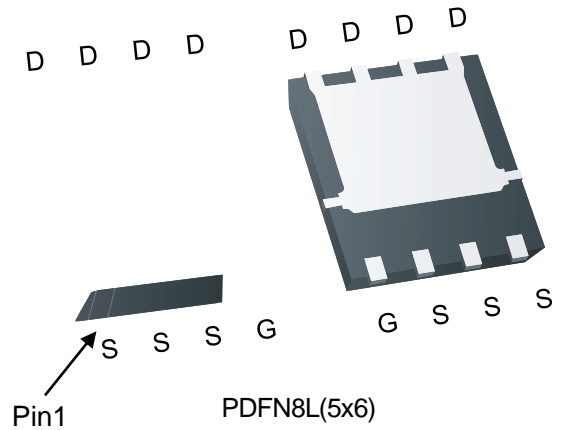


## N-Channel Enhancement Mode MOSFET

### Feature

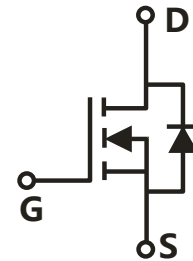
- 40V/143A  
 $R_{DS(ON)} = 2. \quad @V_{GS} = 10V$
- 100% Avalanche Tested
- 100% DVDS
- Reliable and Rugged
- Halogen Free and Green Devices Available  
 (RoHS Compliant)

### Pin Description




### Applications

- Switching application
- Li-battery protection
- DC-DC
- Motor control



Single N-Channel MOSFET

### Ordering and Marking Information

HYG  024N04NS XYMXXXXX	Package Code C2: PDFN8L(5x6)  Date Code XYMXXXXX
---	--

Note: HUAYI halogen free products contain molding compounds and 100% matte tin plate Termination finish; which are fully compliant with RoHS. HUAYI halogen free products meet or exceed the halogen free requirements of IPC/JEDEC J-STD-020 for MSL classification at halogen free peak reflow temperature. HUAYI defines Green to mean halogen free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

HUAYI reserves the right to make changes, corrections, enhancements, modifications, and improvements to this product and/or to this document at any time without notice.

## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b> (Tc=25°C Unless Otherwise Noted)				
V <sub>DSS</sub>	Drain-Source Voltage	40	V	
V <sub>GSS</sub>	Gate-Source Voltage	±20	V	
T <sub>J</sub>	Junction Temperature Range	-55 to 175	°C	
T <sub>STG</sub>	Storage Temperature Range		°C	
I <sub>S</sub>	Source Current-Continuous(Body Diode)	Tc=25°C	143	A
<b>Mounted on Large Heat Sink</b>				
I <sub>DM</sub>	Pulsed Drain Current *	Tc=25°C	428	A
I <sub>D</sub>	Continuous Drain Current	Tc=25°C	143	A
		Tc=100°C	101	A
P <sub>D</sub>	Maximum Power Dissipation	Tc=25°C	106	W
		Tc=100°C	53	W
R <sub>JC</sub>	Thermal Resistance, Junction-to-Case		1.41	°C/W
R <sub>JA</sub>	Thermal Resistance, Junction-to-Ambient **		80	°C/W
E <sub>AS</sub>	Single Pulsed-Avalanche Energy ***	L=0.3mH	225	mJ

Note: \* Repetitive rating; pulse width limited by max.junction temperature.

\*\* Surface mounted on 1in2 FR-4 board.

\*\*\* Limited by T<sub>Jmax</sub> , starting T<sub>J</sub>=25°C, L = 0.3mH, R<sub>e</sub>= 25 , V<sub>Gs</sub>

G024N04NS1		Unit
Typ.	Max	
2.3	-	pF
2096	-	
433	-	
46	-	

## Typical Operating Characteristics

Figure 1: Power Dissipation

Figure 2: Drain Current

Figure 3: Safe Operation Area

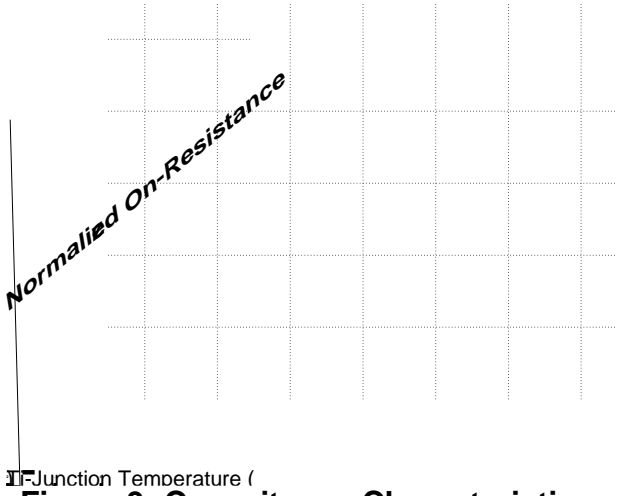
Figure 4: Thermal Transient Impedance

Figure 5: Output Characteristics

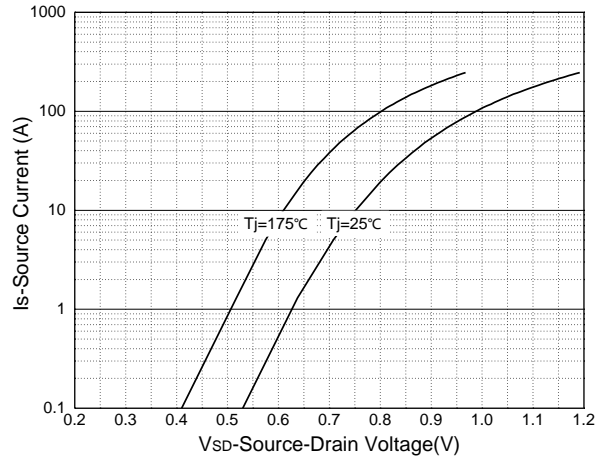
Figure 6: Drain-

**Typical Operating Characteristics(Cont.)**

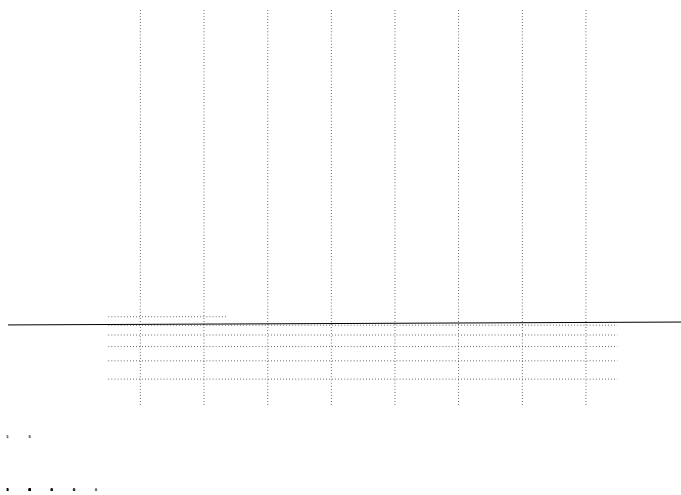
**Figure 7: On-Resistance vs. Temperature**



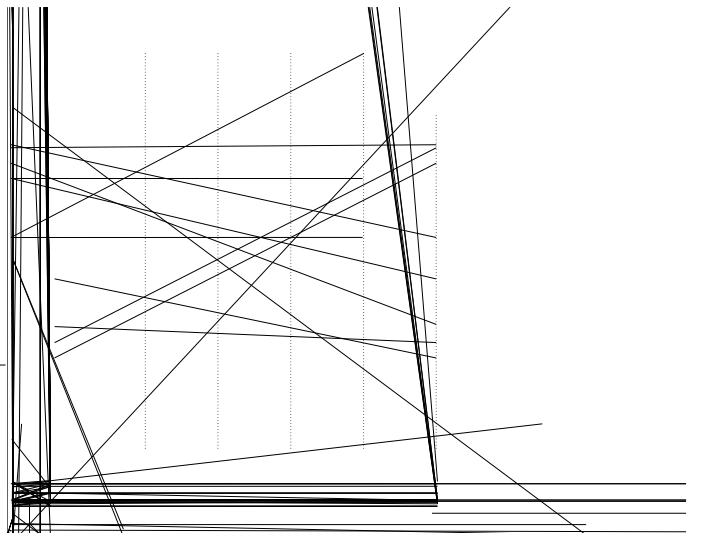
**Figure 8: Source-Drain Diode Forward**



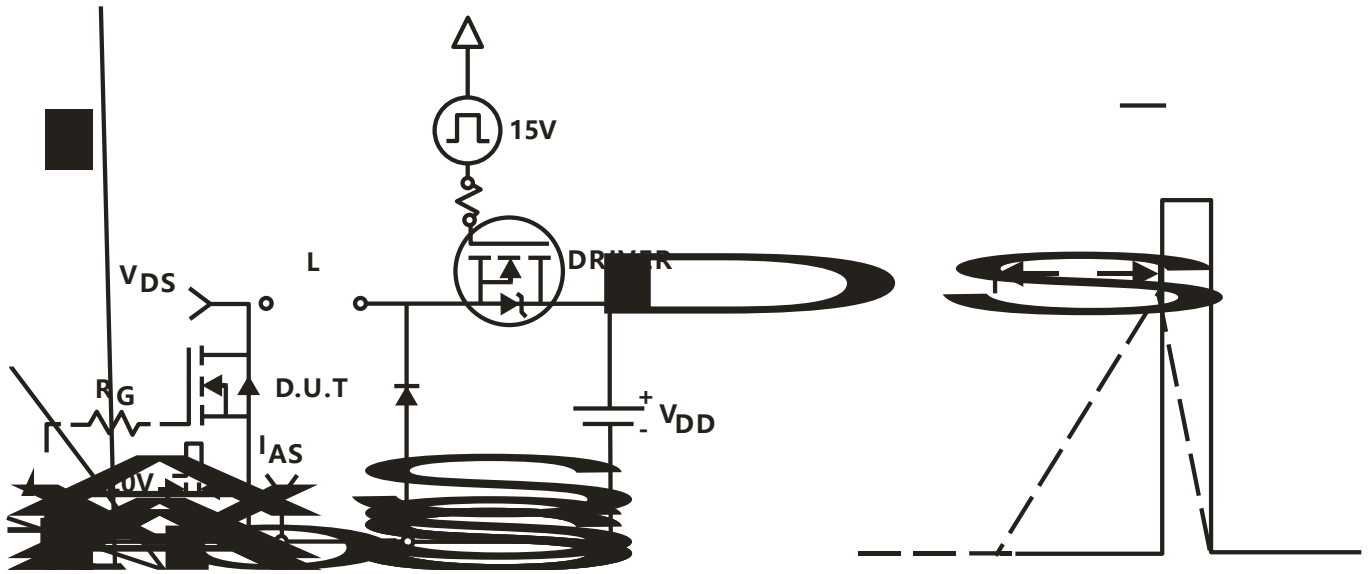
**Figure 9: Capacitance Characteristics**



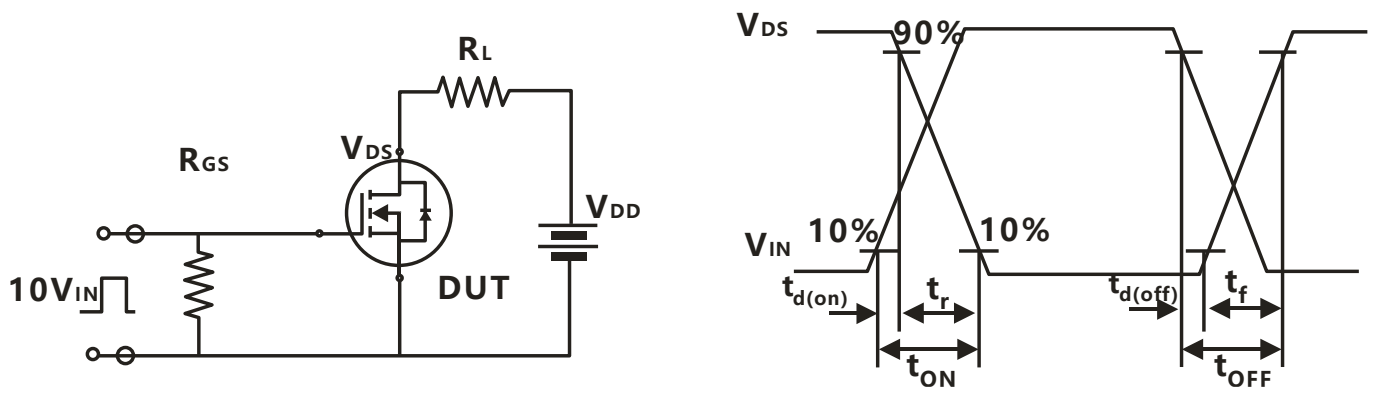
**Figure 10: Gate Charge Characteristics**



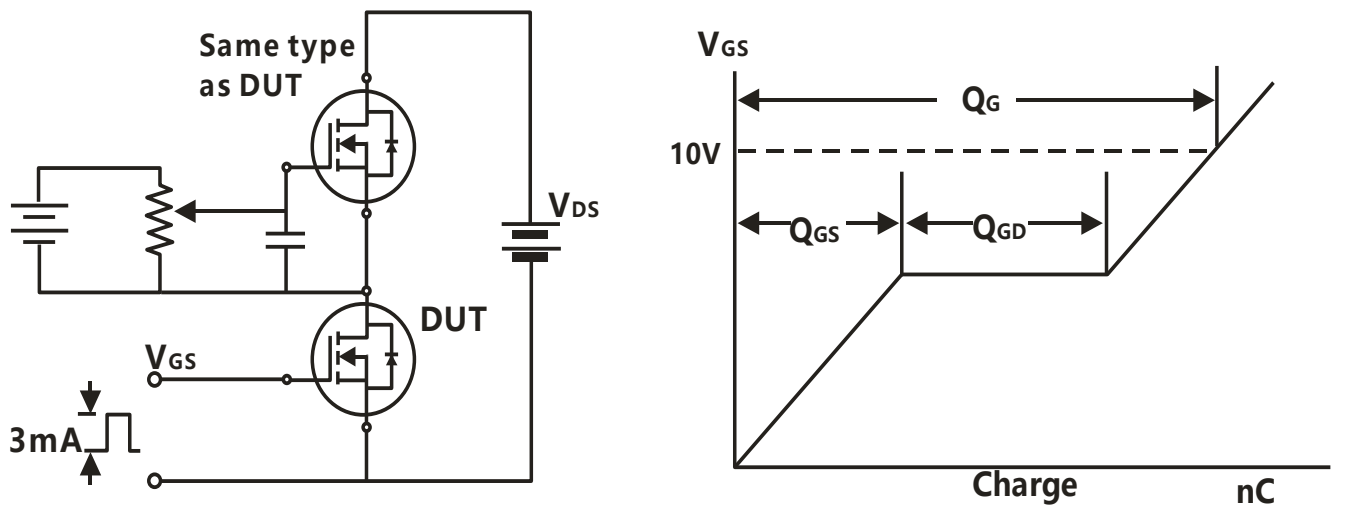
**Avalanche Test Circuit**



**Switching Time Test Circuit**



**Gate Charge Test Circuit**



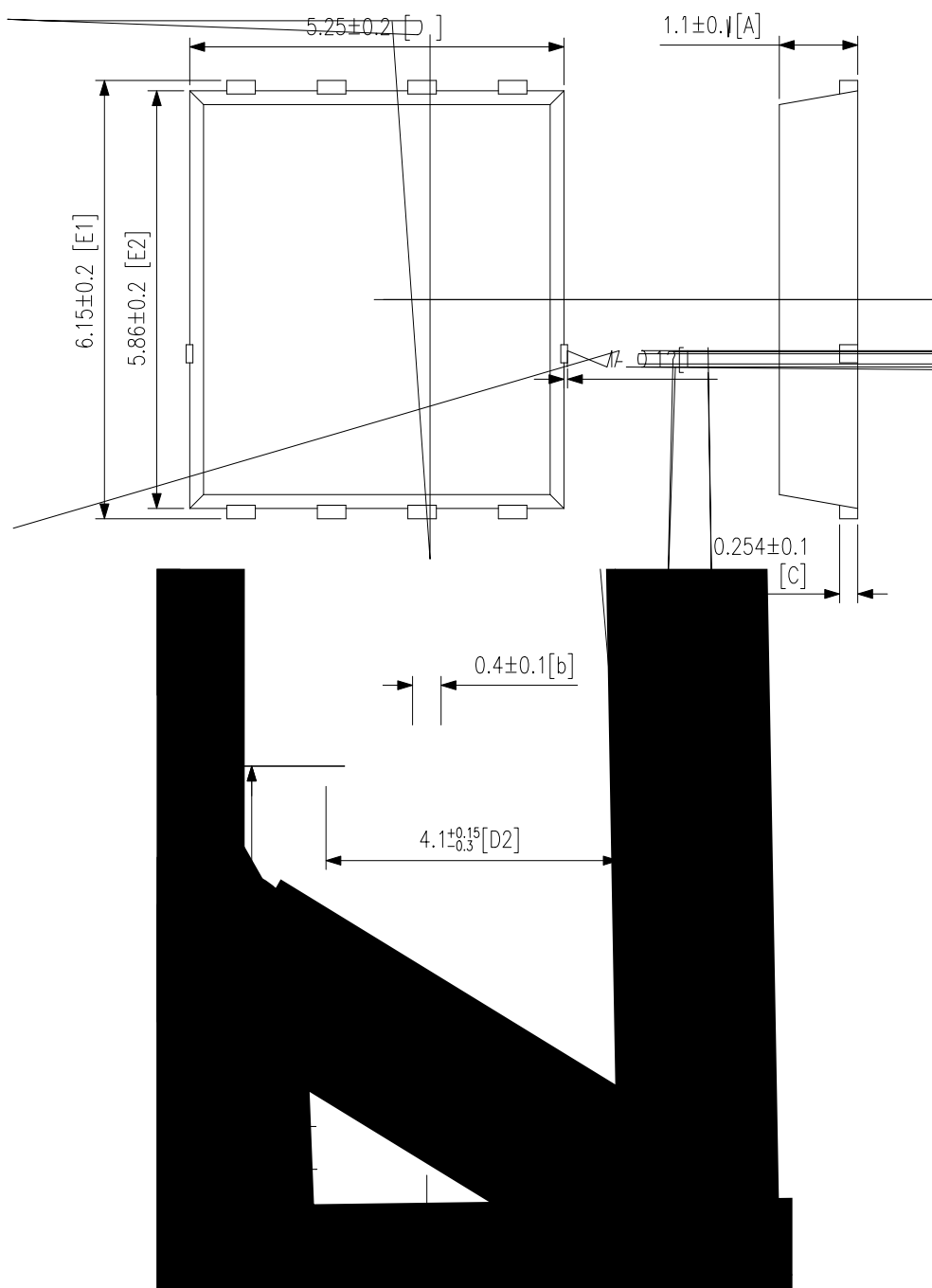
## Device Per Unit

Package Type	Unit	Quantity
PDFN8L(5x6)	Reel	5000

## Package Information

PDFN8L(5x6)

(unit:mm)



**Classification Profile**

**Classification Reflow Profiles**

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
<b>Preheat &amp; Soak</b>		
Temperature min ( $T_{smin}$ )	100 °C	150 °C
Temperature max ( $T_{smax}$ )	150 °C	2298.61 293.93 Td[15
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	



Table 1.SnPb Eutectic Process Classification Temperatures (Tc)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
	220 °C	220 °C

Table 2.Pb-free Process Classification Temperatures (Tc)

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> ≥2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

## Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HTRB	JESD-22, A108	168/500 Hrs, Bias @ 150°C
HTGB	JESD-22, A108	168/500 Hrs, V <sub>gs</sub> 100% @ 150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	250/500 Cycles, -55°C~150°C

## Customer Service

Worldwide Sales and Service: [sales@hymexa.com](mailto:sales@hymexa.com)

Technical Support: [Technology@hymexa.com](mailto:Technology@hymexa.com)

Huayi Microelectronics Co., Ltd.

No.8928, Shangji Road, Economic and Technological Development Zone, Xi'an, China

TEL: (86-029) 86685706

FAX: (86-029) 86685705

E-mail: [sales@hymexa.com](mailto:sales@hymexa.com)

Web net: <http://www.hymexa.com/>