Product Summary

| V$_{(BR)DSS}$	R$_{DS(on)TYP}$	I$_D$
-40V	10.5mΩ@-10V	-23A
	14mΩ@-4.5V	
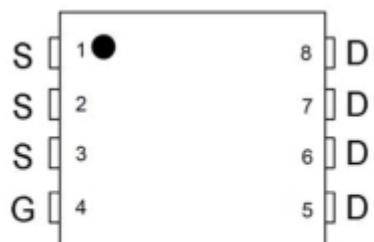
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

Applications
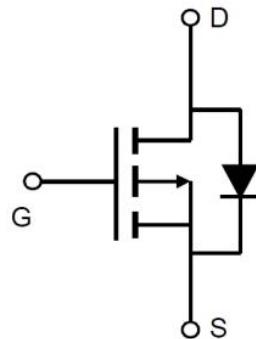
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package
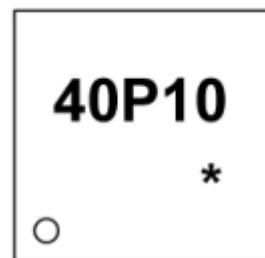
PDFNWB3.3×3.3-8L

Circuit diagram

Marking

40P10 =Device Code
* =Week Code

Absolute maximum ratings

(T$_a$=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V$_{DS}$	-40	V
Gate-Source Voltage	V$_{GS}$	±20	V
Drain Current-Continuous	I$_D$	-23	A
Pulsed Drain Current	I$_{DM}$	-92	A
Maximum Power Dissipation	P$_D$	3.5	W
Thermal Resistance,Junction-to-Ambient	R$_{θJA}$	35.7	℃/W
Operating Junction and Storage Temperature Range	T$_{J,}$ T$_{STG}$	-55 to 150	℃
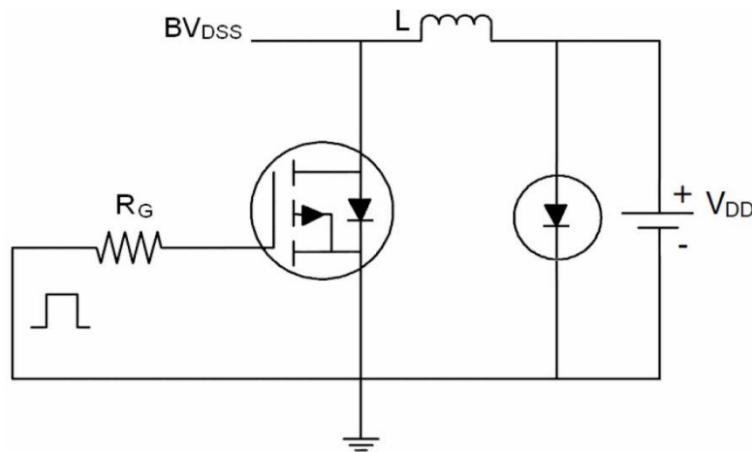
Electrical characteristics

(T_A=25℃, unless otherwise noted)
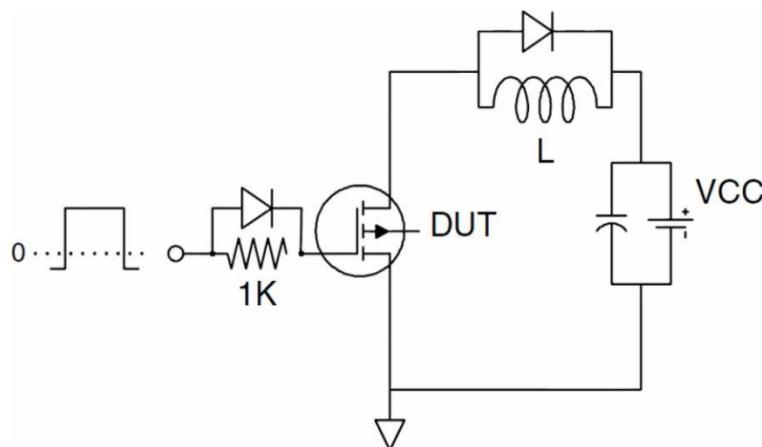
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-40V, V_{GS} = 0V			-1	uA
Gate-Source Leakage	I_{GSS}	V_{GS} =±20V, V_{DS} =0V			±100	uA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.6	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-12A		10.5	14	mΩ
		V_{GS} =-4.5V, I_D =-10A		14	20	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		3580		pF
Output Capacitance	C_{oss}			323		
Reverse Transfer Capacitance	C_{rss}			220		
Switching Characteristics						
Turn-on Delay Time	$T_{d(on)}$	V_{DD}=-20V, I_D=-1A , V_{GS}=-10V, R_G=6Ω		12		nS
Turn-on Rise Time	T_r			25		
Turn-off Delay Time	$T_{d(off)}$			30		
Turn-off Fall Time	T_f			24		
Total Gate Charge	Q_g	V_{DS} =-20V, , I_D=-25A V_{GS} =-10V		41		nC
Gate-Source Charge	Q_{gs}			11		
Gate-Drain Charge	Q_{gd}			8		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-1A			-1.2	V

# Test Circuits
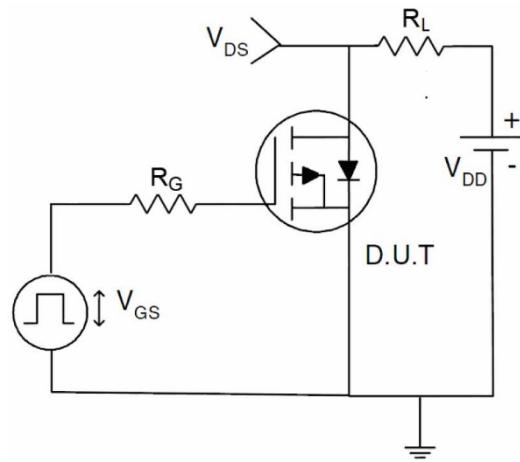
- EAS Test Circuits

- Gate Charge Test Circuit

- Switch Time Test Circuit

## Typical Characteristics
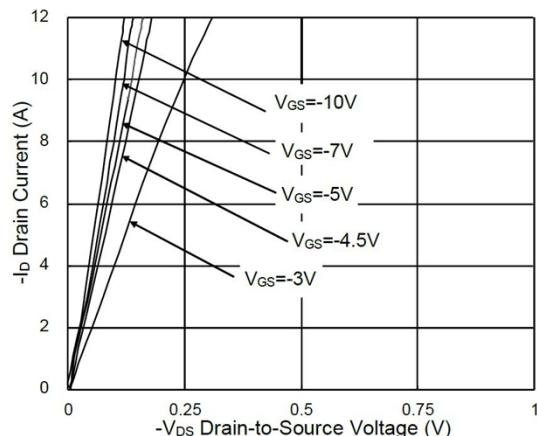
Fig.1 Typical Output Characteristics
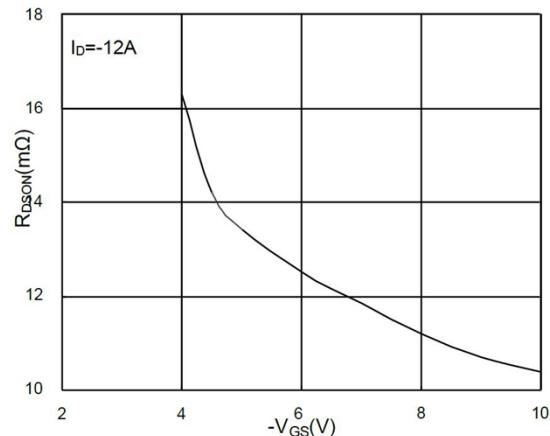
Fig.2 On-Resistance v.s Gate-Source
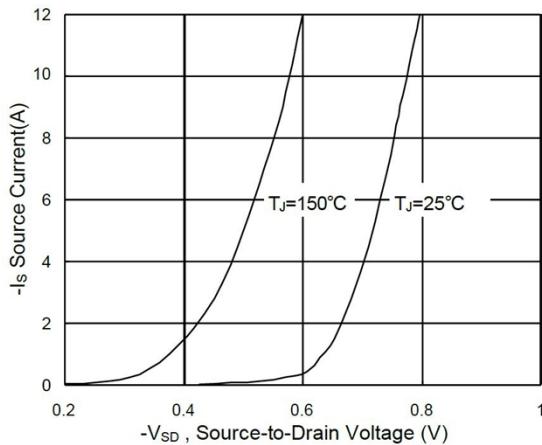
Fig.3 Forward Characteristics Of Reverse
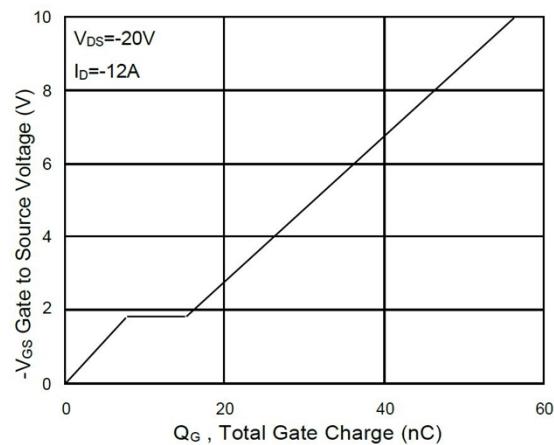
Fig.4 Gate-Charge Characteristics
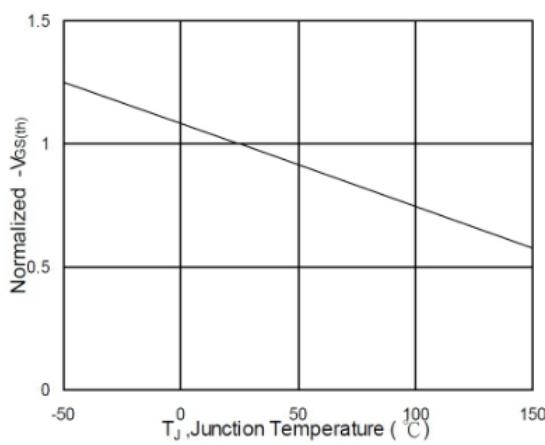
Fig.5 Normalized $V_{GS(th)}$ v.s T_J
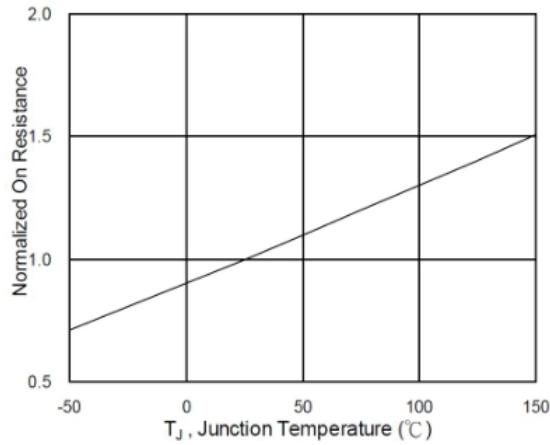
Fig.6 Normalized R_{DSON} v.s T_J
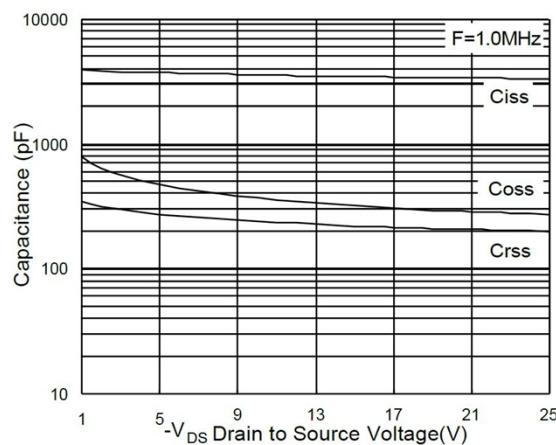
Fig.7 Capacitance
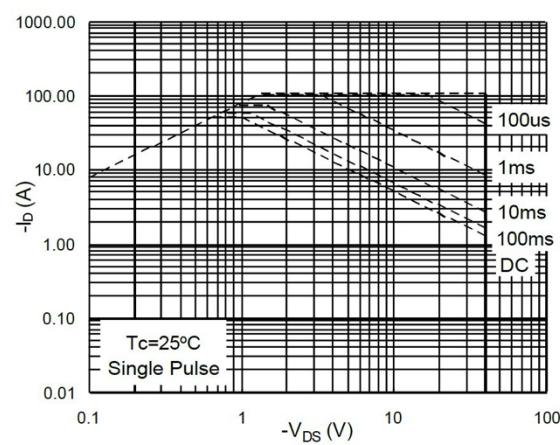
Fig.8 Safe Operating Area
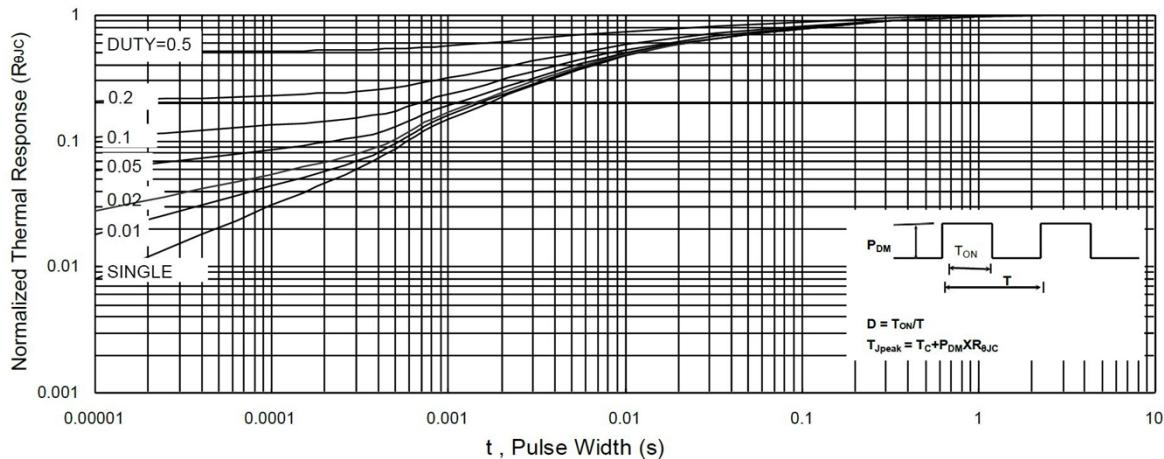
Fig.9 Normalized Maximum Transient Thermal Impedance

$$EAS = \frac{1}{2} L \times (-I_{AS}^2) \times \frac{-BV_{DSS}}{-BV_{DSS}-(-V_{DD})}$$
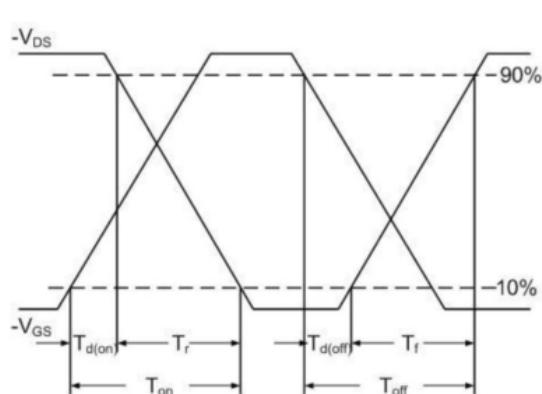
Fig.10 Switching Time Waveform
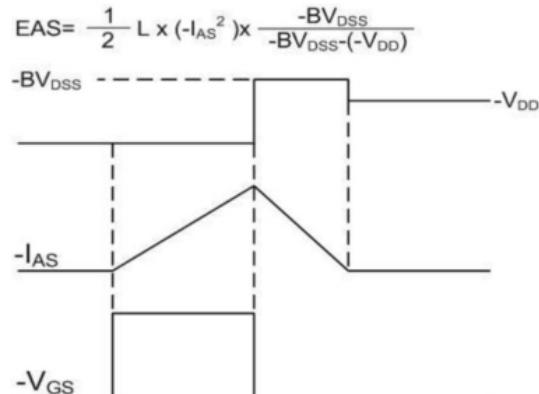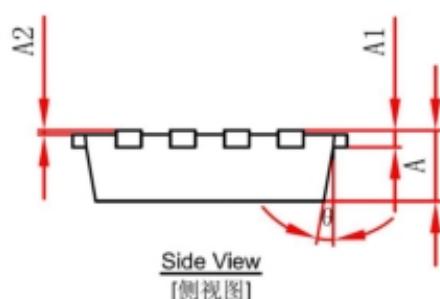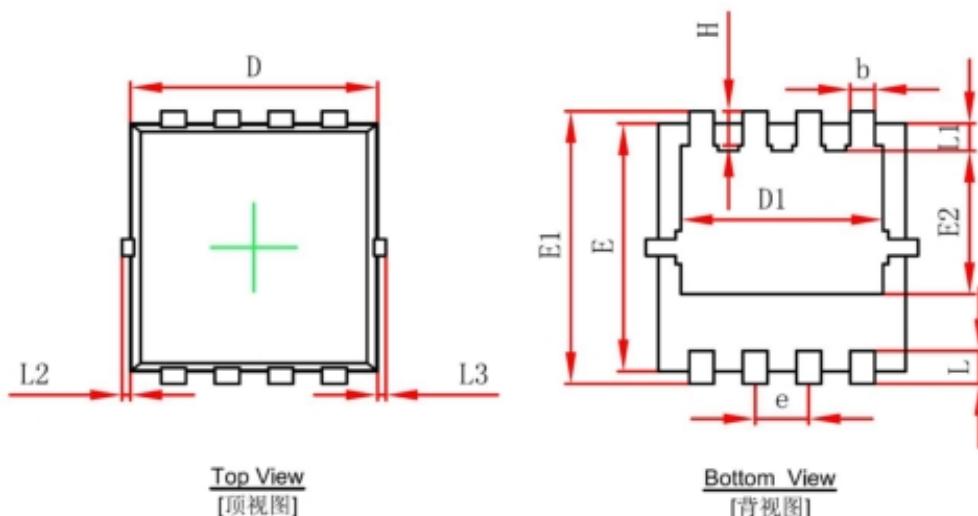
Fig.11 Unclamped Inductive Waveform

PDFNWB3.3×3.3-8L Package Information

Top View
[顶视图]

Bottom View
[背视图]

Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°