Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	8mΩ@10V	50A
	11mΩ@4.5V	

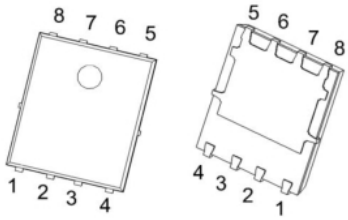
Feature

- V_{DS} =40V,I_D =50A
- $R_{DS(ON)}$ <11mΩ @ V_{GS}=10V (Typ. 8 mΩ)
  $R_{DS(ON)}$ <17mΩ @ V_{GS}=4.5V (Typ. 11 mΩ)
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current

Application

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package



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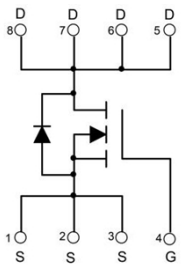
Circuit diagram



Marking

40N08 : Product code
* : Month 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
Continuous Drain Current(Note 4)	T_C=25℃	I_D	50	A
Pulsed Drain Current (Note 1)	T_C=25℃	I_{DM}	200	A
Power Dissipation	T_C=25℃	P_D	83.8	W
	T_C=100℃		41.9	
Continuous Drain Current (Note 4)	T_C=25℃	I_D	11	A
	T_C=70℃		9	
Power Dissipation	T_C=25℃	P_D	2.4	W
	T_C=70℃		1.6	
Single Pulse Avalanche Energy (Note 6)		E_{AS}	72	mJ
Typical Thermal Resistance (Note 4,5)	Junction to Case	$R_{\theta JC}$	1.79	℃/W
	Junction to Ambient	$R_{\theta JA}$	62.5	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

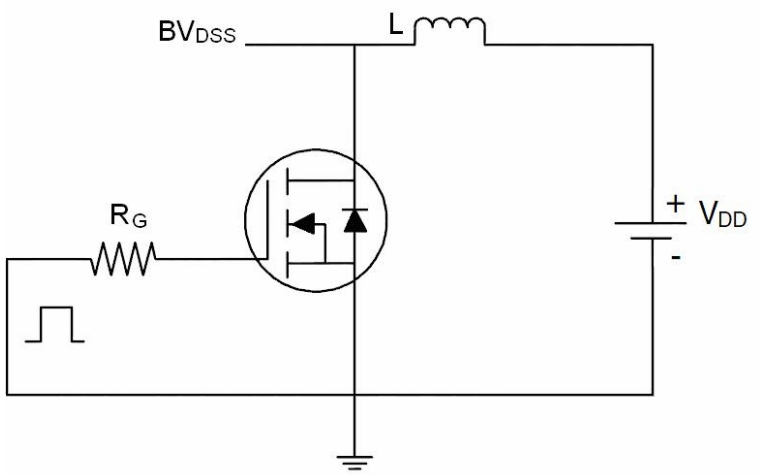
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =12A		8	12	mΩ
		V_{GS} =4.5V, I_D =6A		11	18	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =40V,V_{GS} = 0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±20V , V_{DS}=0V			100	uA
Dynamic Characteristics (3)						
Total Gate Charge	Q_g	V_{DS}=20V, I_D =8A, V_{GS}=10V (Note 2,3)		22		pF
Gate-Source Charge	Q_{gs}			4.2		
Gate-Drain Charge	Q_{gd}			4		
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz		1013		pF
Output Capacitance	C_{oss}			134		
Reverse Transfer Capacitance	C_{rss}			88		
Switching Characteristics (3)						
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=15V, I_D =1A, V_{GS}=10V, R_G =3.3Ω		13		nS
Rise Time	T_r			14		
Turn-Off Delay Time	$T_{d(off)}$			45		
Fall Time	T_f			9		
Diode Characteristics						
Maximum Continuous Drain-Source Diode Forward Current	I_S				50	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1A		0.7	1	V

Notes:

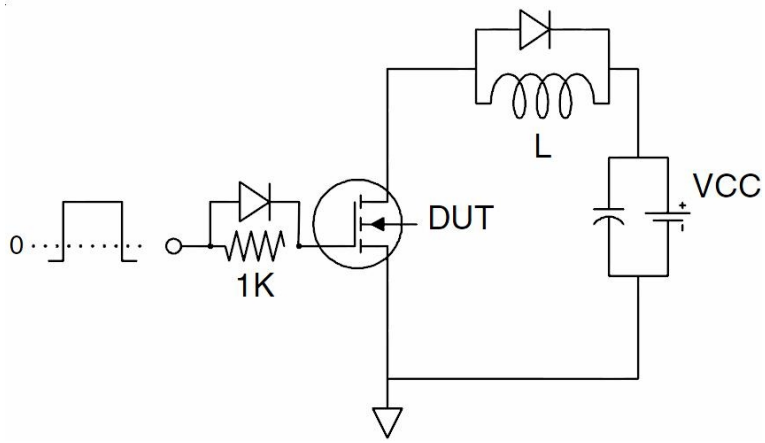
1. Pulse width<300us, Duty cycle<2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.
4. The maximum current rating is package limited.
5. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch2 with 2oz.square pad of copper.
6. The test condition is L=0.1mH, I_{AS}=38A, V_{DD}=25V, V_{GS}=10V, Starting T_J=25oC.
7. Guaranteed by design, not subject to production testing.

Test Circuits

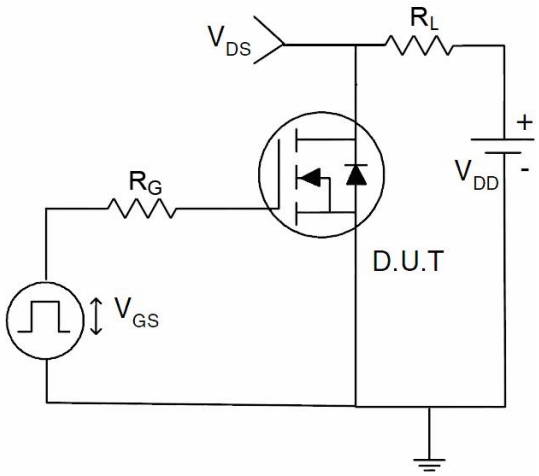
- EAS Test Circuits



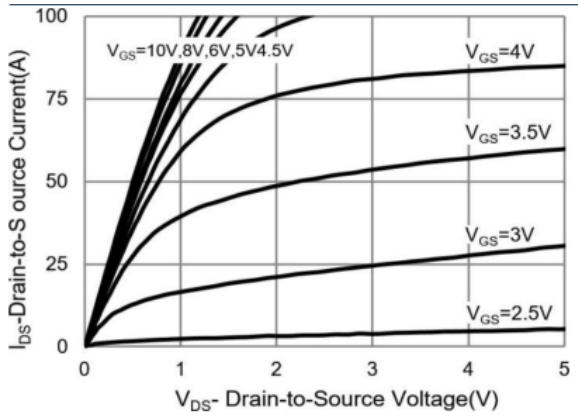
- Gate Charge Test Circuit



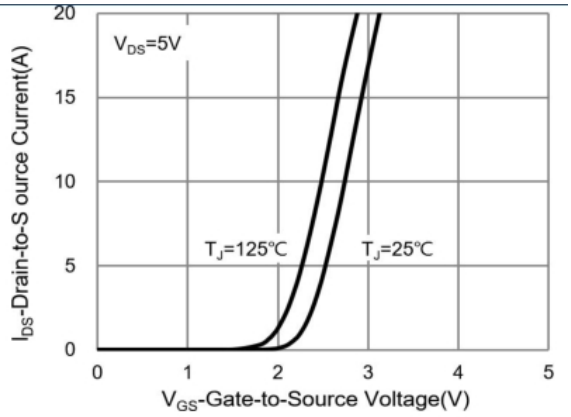
- Switch Time Test Circuit



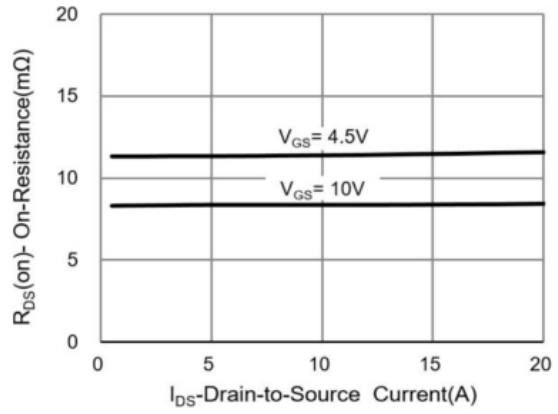
Typical Characteristics



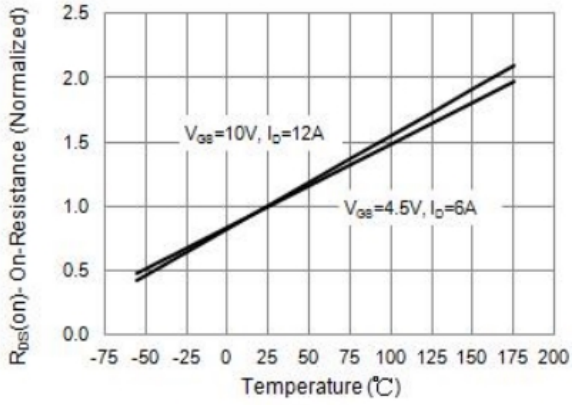
On-Region Characteristics



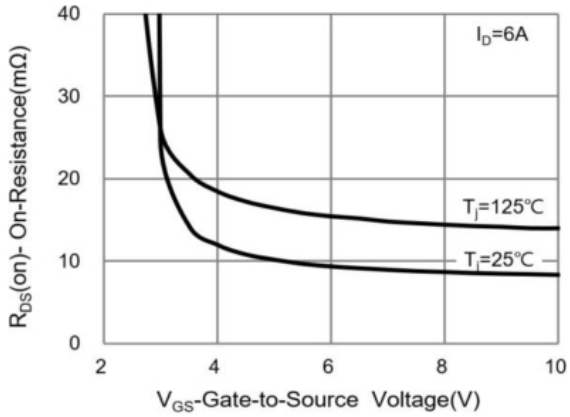
Transfer Characteristics



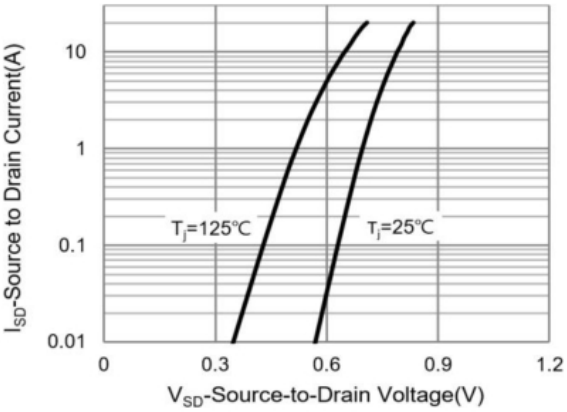
On-Resistance vs. Drain Current



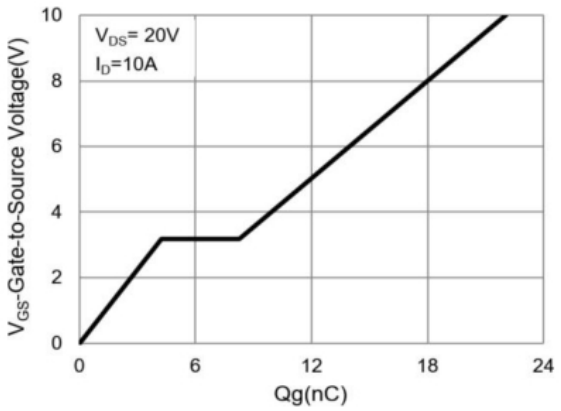
On-Resistance vs. Junction temperature



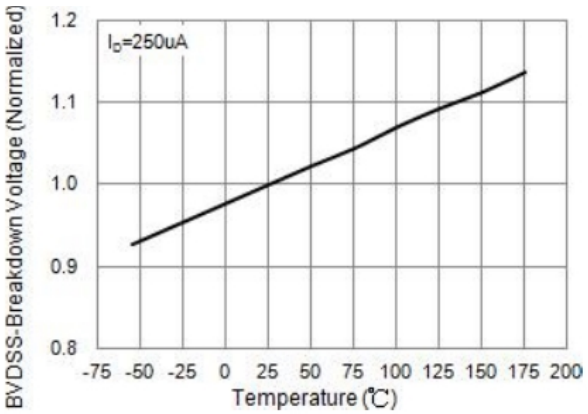
On-Resistance Variation with V_{GS}



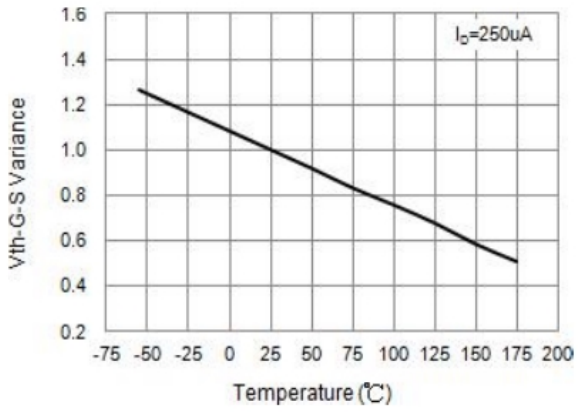
Body Diode Characteristics



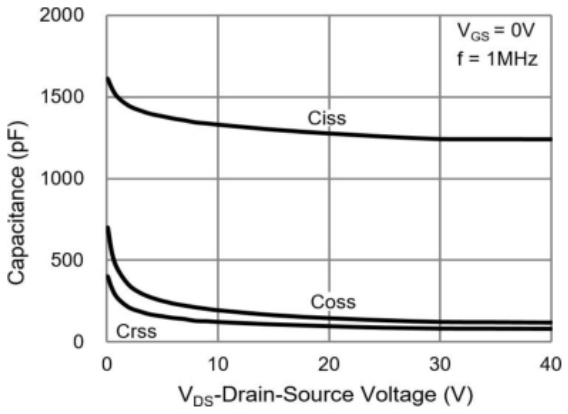
Gate-Charge Characteristics



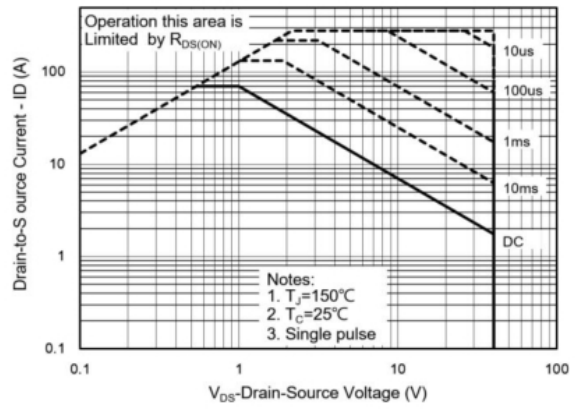
Breakdown Voltage Variation vs. Temperature



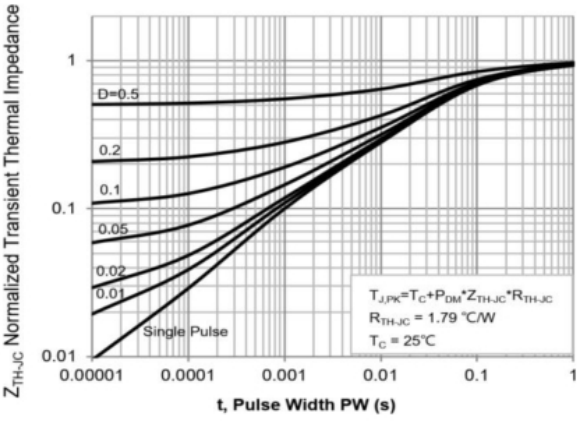
Threshold Voltage Variation with Temperature



Capacitance vs. Drain-Source Voltage

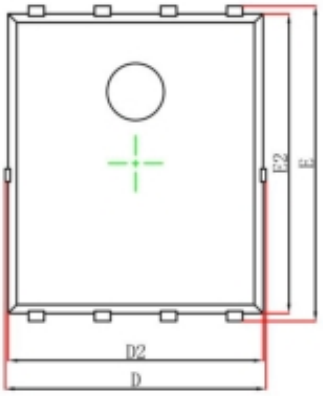


Maximum Safe Operating Area

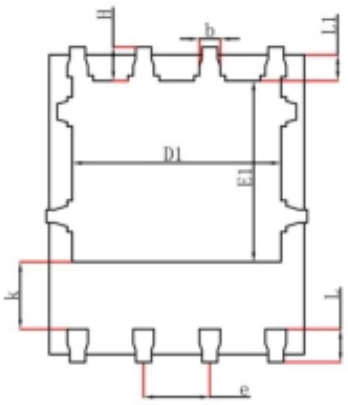


Normalized Transient Thermal Impedance

PDFNWB5X6-8L 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	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°