

60V N-Channel Advanced Mode Power MOSFET

Product Summary

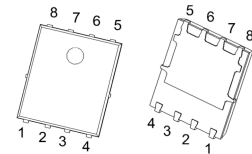
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	2.0mΩ@10V	150A

Features

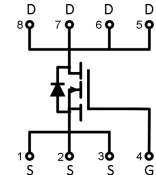
- ◆ Advanced Split Gate Trench Technology
- ◆ Excellent $R_{DS(ON)}$ and Low Gate Charge
- ◆ Lead free product is acquired

Applications

- ◆ Power Management in Computing, CE, IE 4.0, Communications
- ◆ Current Switching in DC/DC & AC/DC Sub-systems
- ◆ Motor Driving, Quick/Wireless Charging



PDFNWB5×6-8L



Circuit diagram



G020N06A : Device Code
YY : Year Code
WW : Week Code

Marking (Top View)

Order information

Device	Package	Shipping
ANG020N06ASL0	PDFNWB5×6-8L	5000/Tape&Reel

Absolute maximum ratings

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	60	V
Drain Current	$T_C = 25^\circ\text{C}$	I_D	150	A
	$T_C = 100^\circ\text{C}$		100	A
Drain Current - Pulsed ¹		I_{DM}	600	A
Gate-Source Voltage		V_{GSS}	±20	V
Single Pulsed Avalanche Energy ²		E_{AS}	552	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	120	W
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	1.04	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	°C

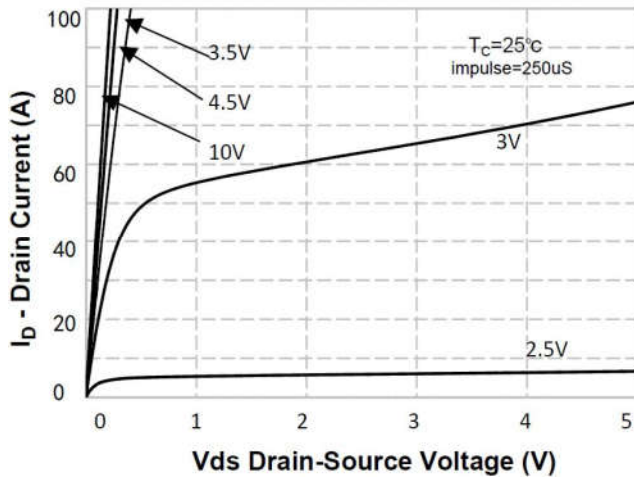
Electrical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V			1	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.5	2.5	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 30A		2.0	2.5	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f= 1.0 MHz		5460		pF
Output Capacitance	C _{oss}			2040		
Reverse Transfer Capacitance	C _{rss}			5.5		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =30V, I _D =30A, V _{GS} =10V		70		nC
Gate-source Charge	Q _{gs}			21		
Gate-drain Charge	Q _{gd}			33		
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DS} =30V, R _G = 4.7Ω, I _D =60A		20		ns
Turn-on Rise Time	t _r			127		
Turn-off Delay Time	t _{d(off)}			95		
Turn-off Fall Time	t _f			25		
Source - Drain Diode Characteristics						
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _{SD} = 30A, T _J = 25℃			1.4	v

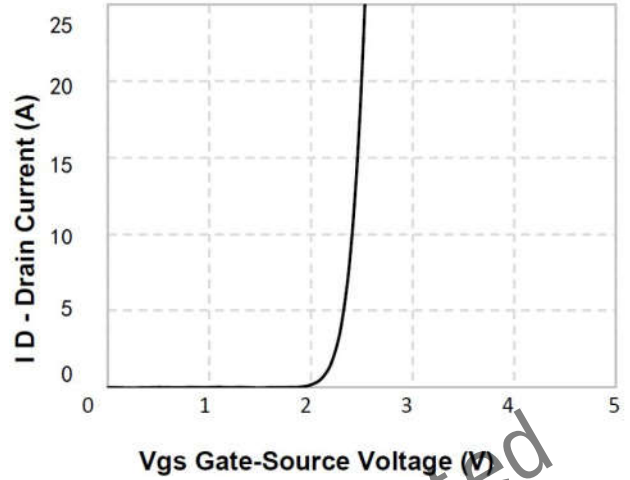
Notes:

- Drain current limited by maximum junction temperature.
- E_{AS} condition: $T_J = 25^\circ\text{C}, V_{DD} = 30V, V_G = 10V, L = 0.5\text{mH}$,

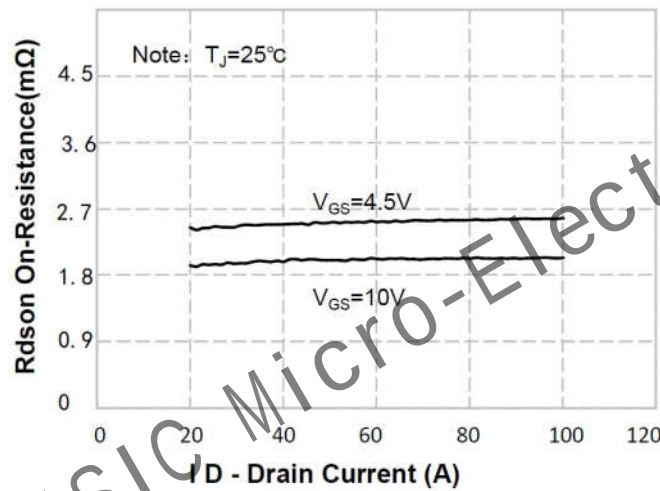
Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)



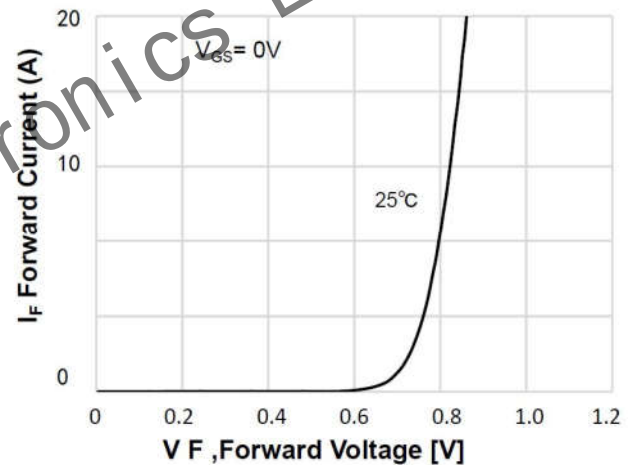
Output Characteristics



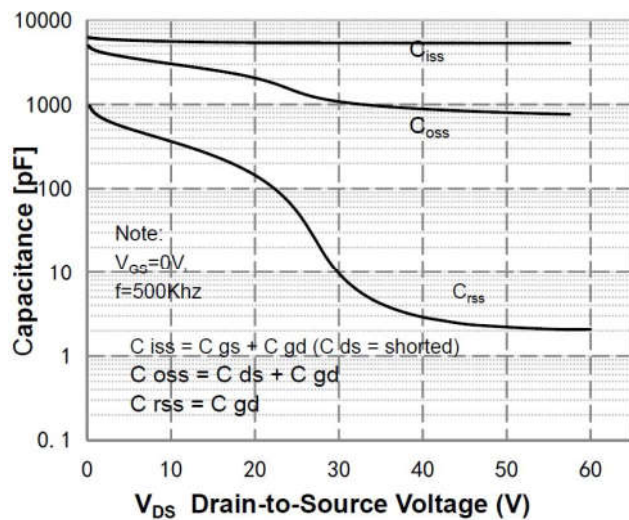
Transfer Characteristics



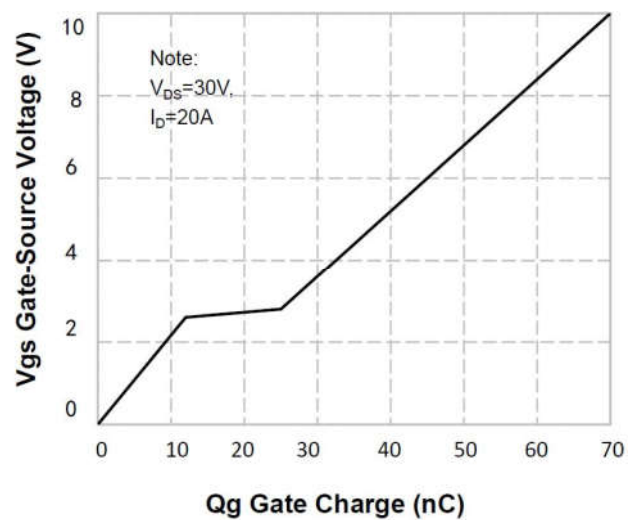
On Resistance vs. Drain Current



Body-Diode Characteristics

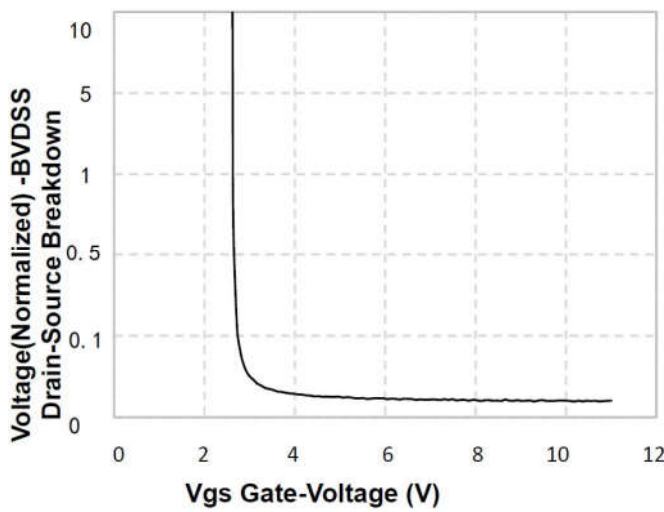


Capacitance Characteristics

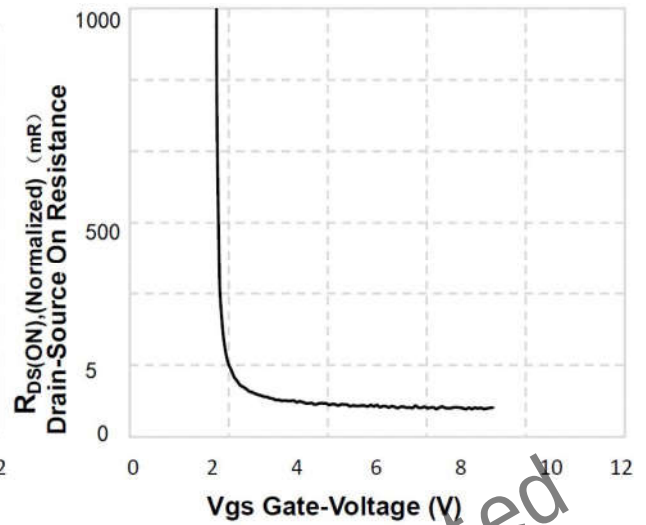


Gate Charge

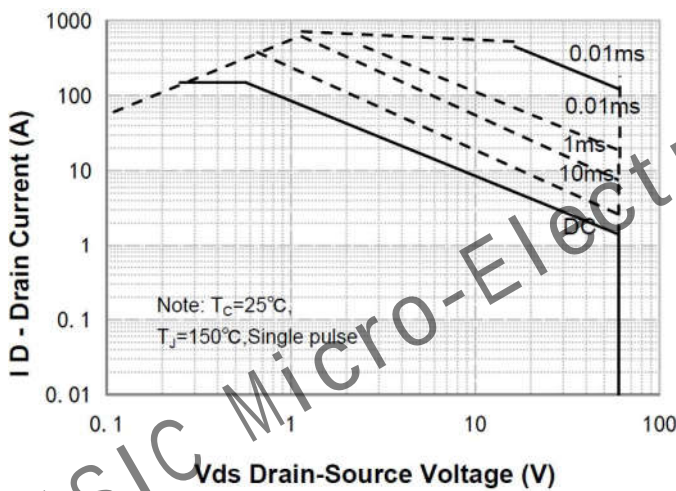
Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)



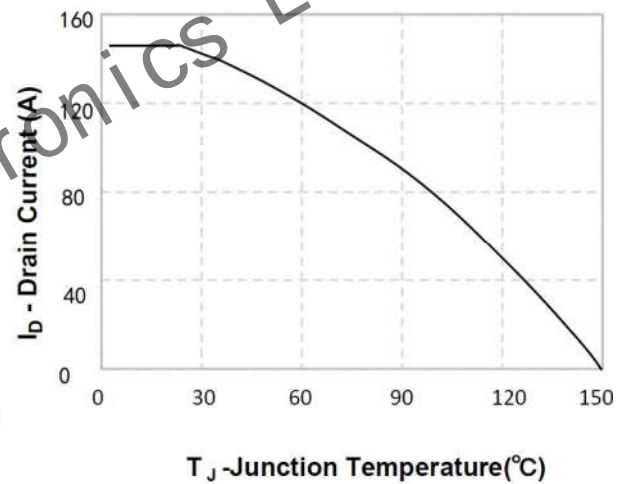
Breakdown Voltage Variation vs Gate Voltage



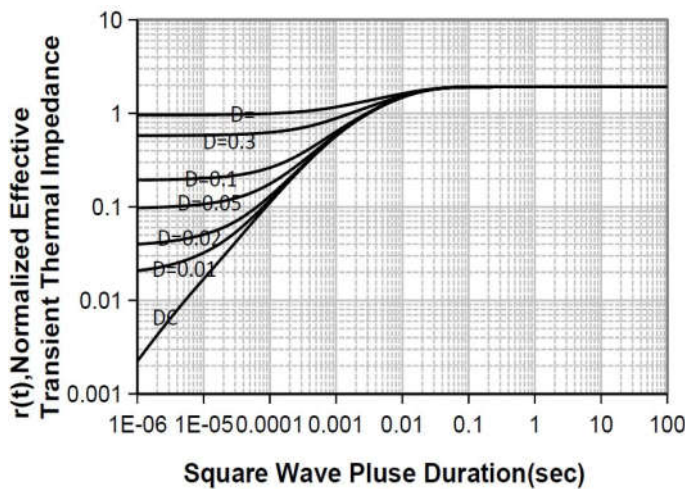
On-Resistance Variation vs Gate Voltage



Maximum Safe Operating Area

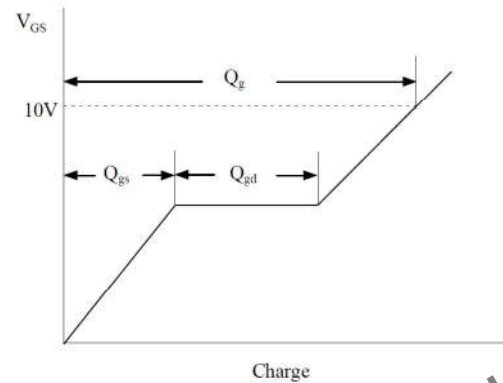
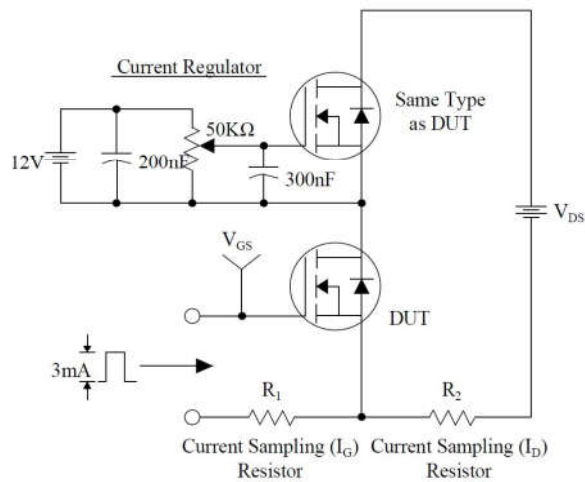


T_J - Junction Temperature($^\circ\text{C}$)
Current De-rating

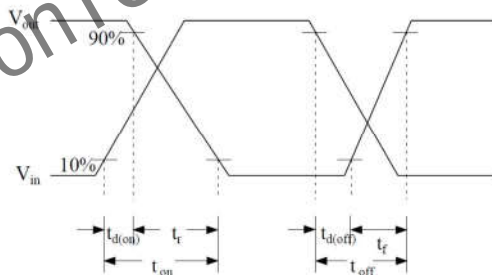
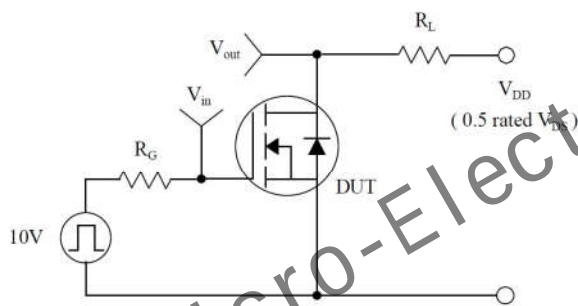


Transient Thermal Impedance, Junction-Case

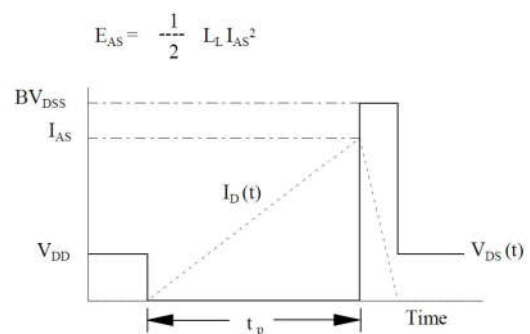
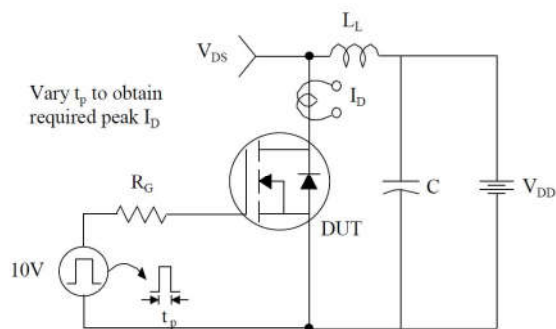
Gate Charge Test Circuit & Waveform



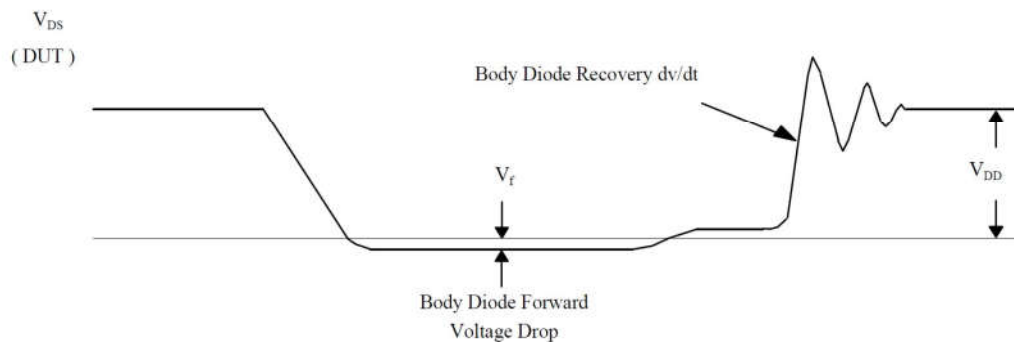
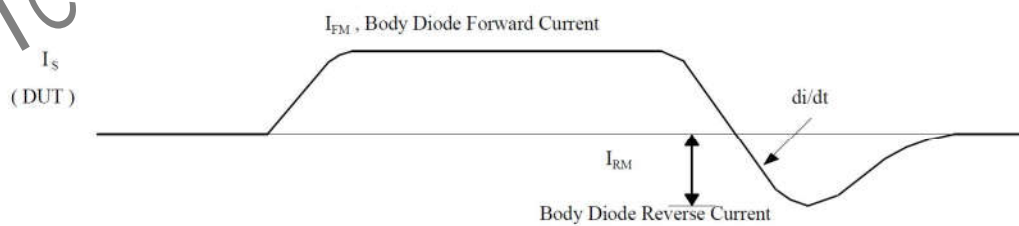
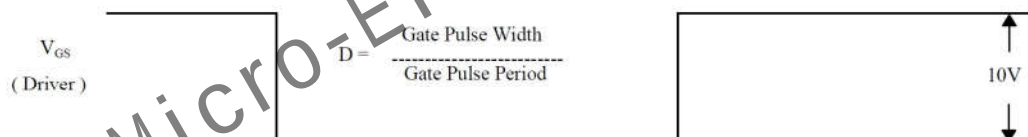
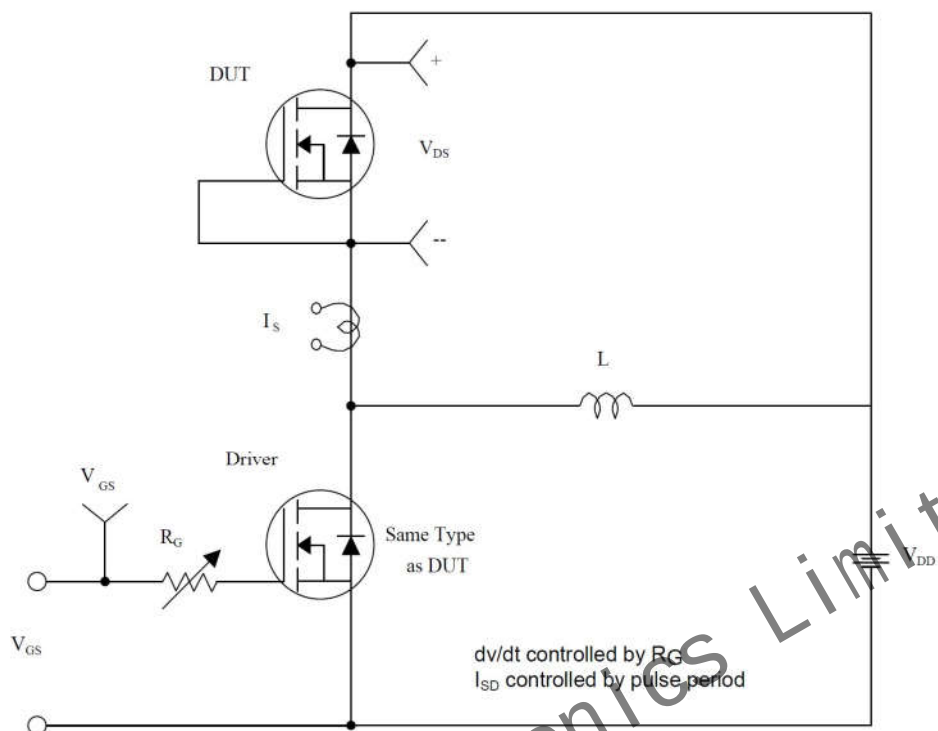
Resistive Switching Test Circuit & Waveforms

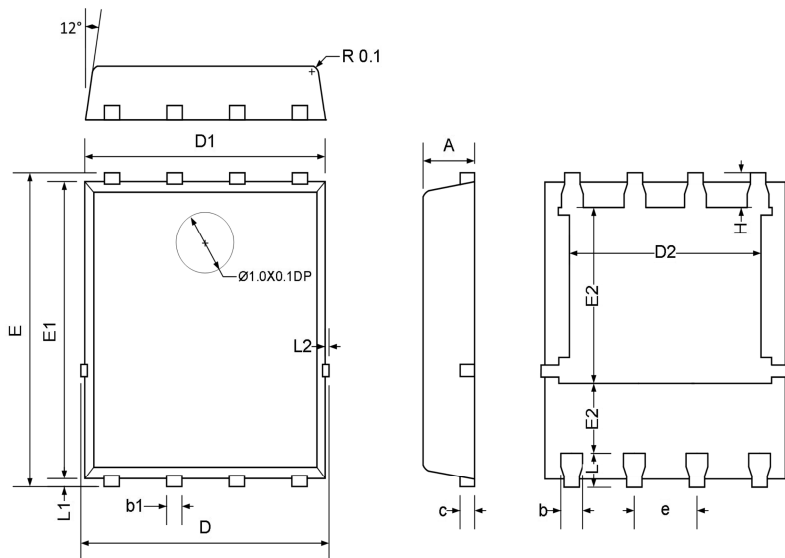


Unclamped Inductive Switching Test Circuit & Waveforms

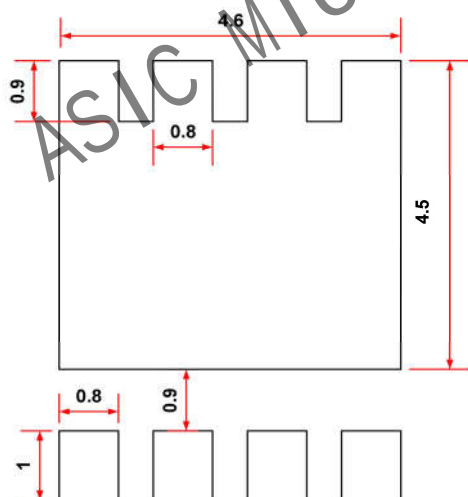


Peak Diode Recovery dv/dt Test Circuit & Waveforms



PACKAGE OUTLINE DIMENSIONS
PDFNWB5×6-8L


Symbol	Dimensions in millimeters		
	Min.	Typ.	Max.
A	0.09	1.00	1.05
b	0.35	0.40	0.45
b1	0.25	0.30	0.35
c	0.21	0.25	0.34
D	4.90	5.00	5.10
D1	4.80	4.90	5.00
D2	3.82	3.96	4.11
e	1.17	1.270	1.370
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.18	3.3	3.54
H	0.51	0.61	0.71
K	1.1	—	—
L	0.51	0.61	0.71
L1	0.07	0.125	0.2
L2	—	—	0.10

Recommended PCB Layout (Unit: mm)

Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.