

-30V P-Channel Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	6m Ω @-10V	-60A
	9m Ω @-4.5V	

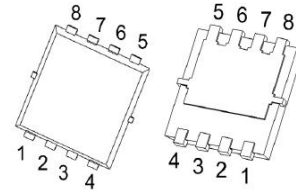
Features

- Very Low On-resistance $R_{DS(on)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

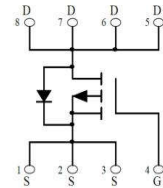
Applications

- PWM Application
- Load Switch
- Power Management

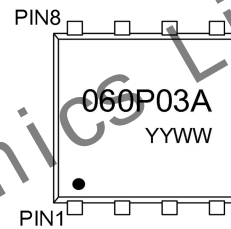
PDFNWB3.3x3.3-8L



Schematic diagram



Marking



060P03A : Device Code
YY : Year Code
WW : Week Code

Absolute Maximum rating ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Drain - Source Voltage	V_{DS}	-30	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	-60	A
Single Pulsed Avalanche Energy ¹	E_{AS}	285	mJ
Power Dissipation	P_D	46	W
$T_C = 25^\circ\text{C}$			
Thermal Resistance from Junction-to-Case	$R_{\theta Jc}$	2.72	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	$T_{J, T_{STG}}$	-55~ +150	$^\circ\text{C}$

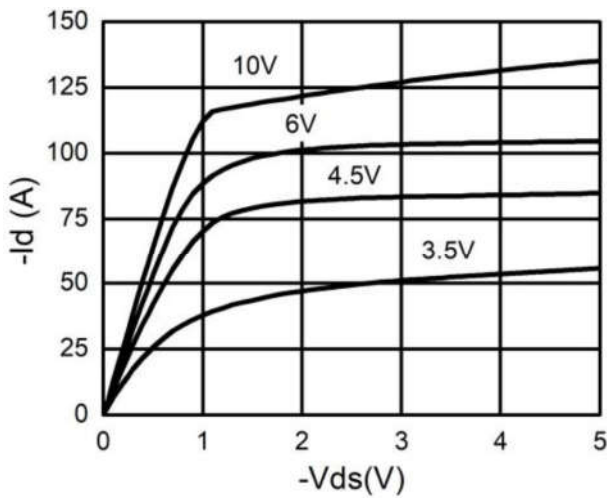
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30V, 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 = -20A		6	8	mΩ
		V _{GS} = -4.5V, I _D = -15A		9	12	
Forward Transconductance	g _{FS}	V _{DS} = -5V, I _D = -20A		35		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -15 V, V _{GS} = 0 V, f= 1.0 MHz		3250		pF
Output Capacitance	C _{oss}			380		
Reverse Transfer Capacitance	C _{rss}			230		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = -15V, I _D = -20A, V _{GS} = -10V		60		nC
Gate-source Charge	Q _{gs}			7.5		
Gate-drain Charge	Q _{gd}			16		
Turn-on Delay Time	t _{d(on)}	V _{GS} = -10V, V _{DS} = -15V, R _L = 0.75Ω ,R _G = 0.75Ω		20		ns
Turn-on Rise Time	t _r			48		
Turn-off Delay Time	t _{d(off)}			76		
Turn-off Fall Time	t _f			45		
Source - Drain Diode Characteristics						
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _{SD} = -20A,T _J = 25℃			-1.2	V
Reverse Recovery Time	t _{rr}	I _F = -10A, dI/dt= 100A/μs		15		ns
Reverse Recovery Charge	Q _{rr}			20		nC

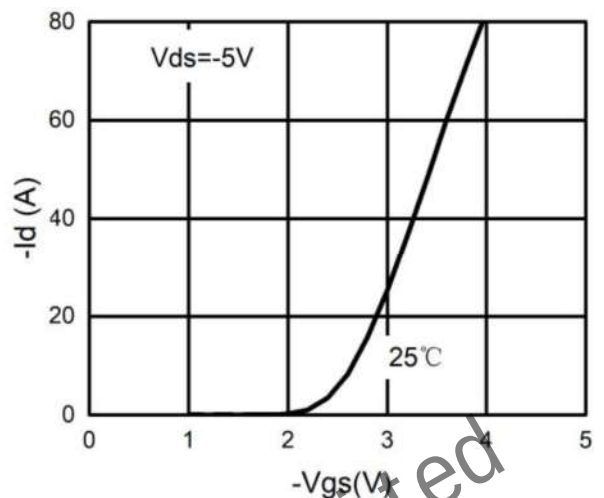
Notes:

1. E_{AS} condition: $T_J = 25^\circ\text{C}, V_{DD} = -30V, V_G = -10V, R_G = 25\Omega, L = 0.5mH$

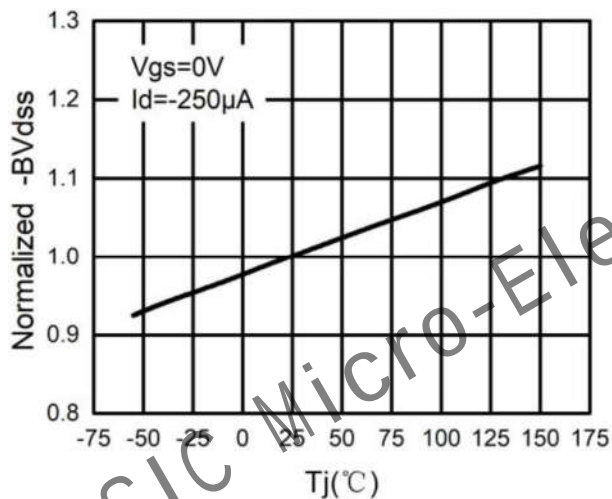
Typical Characteristic



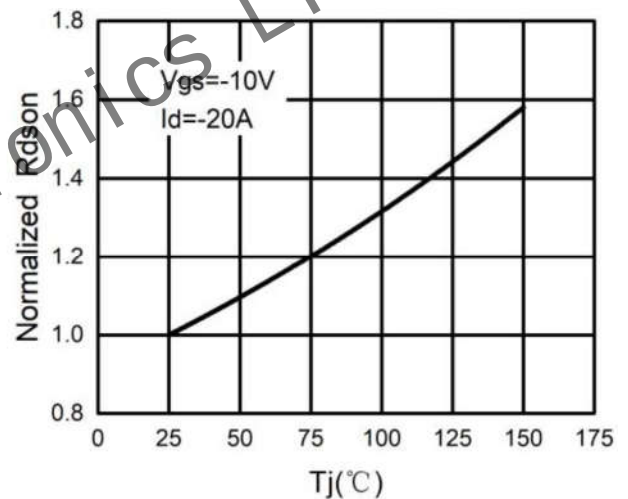
Output Characteristics



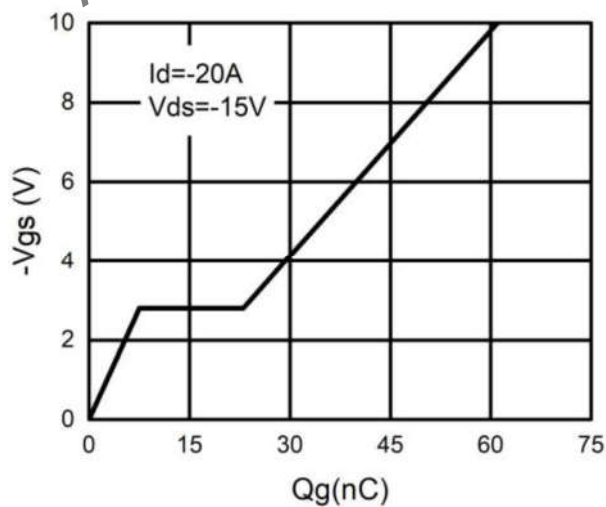
Transfer Characteristics



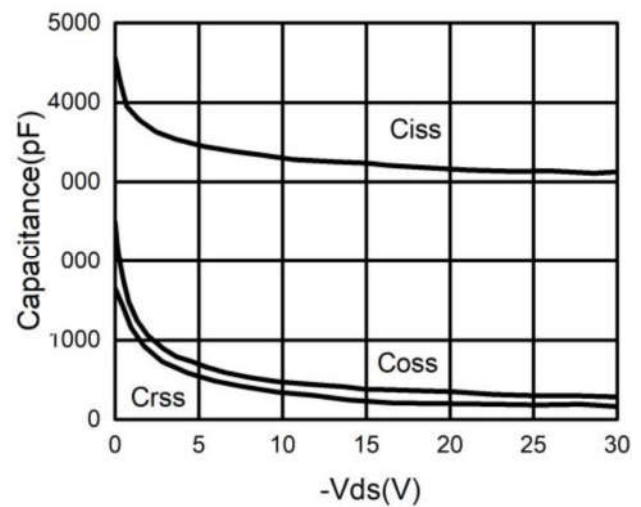
BV_{DSS} vs Junction Temperature



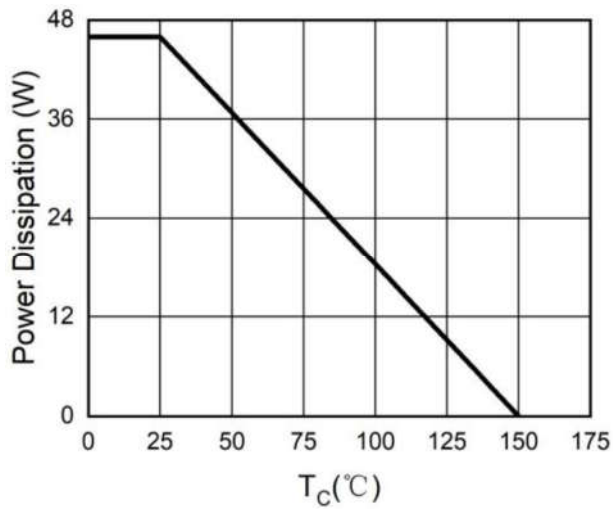
$R_{DS(ON)}$ vs Junction Temperature



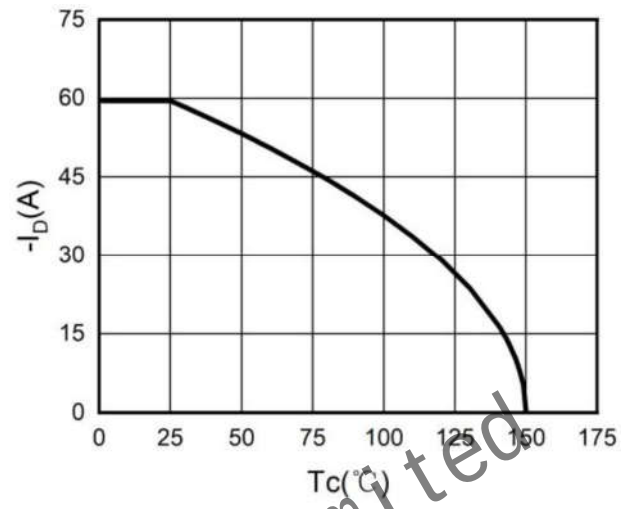
Gate Charge Characteristics



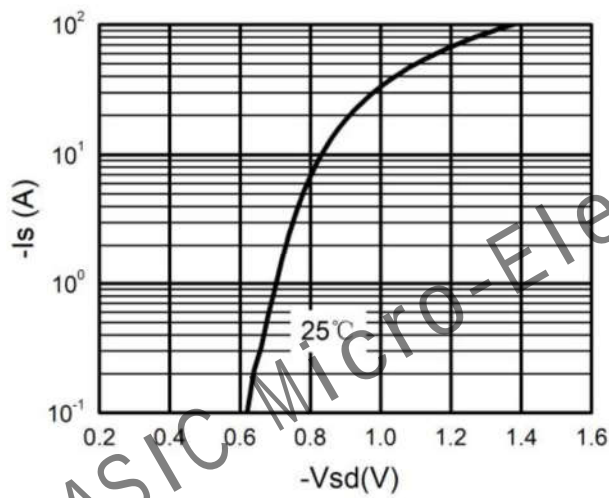
Capacitance Characteristics



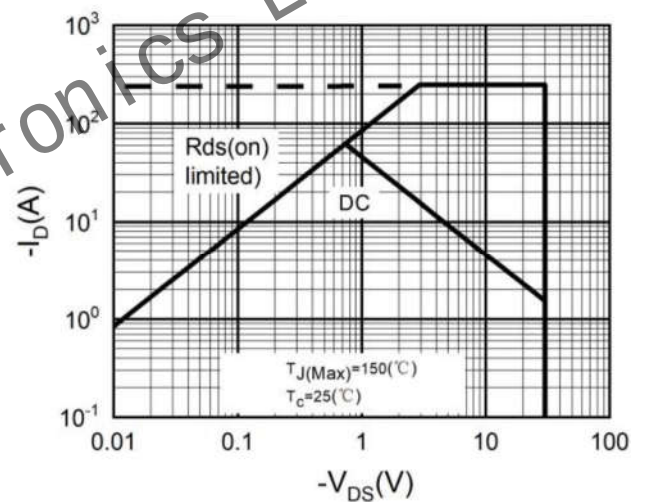
Power Dissipation



Drain Current



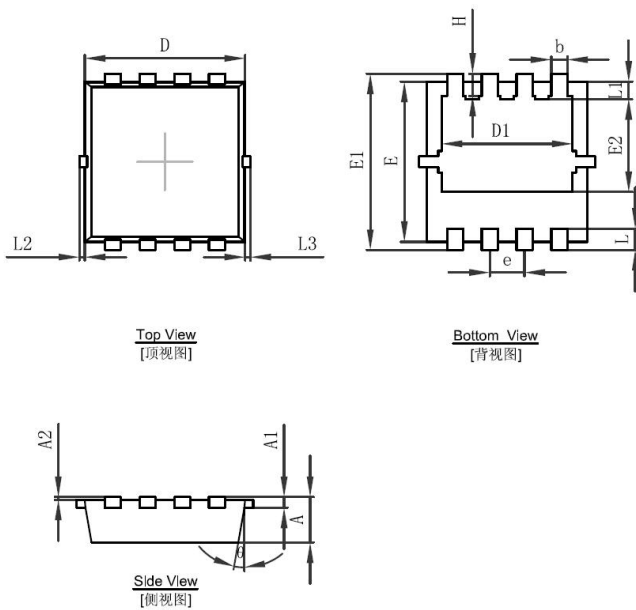
Body-Diode Characteristics



Maximum Safe Operating Area

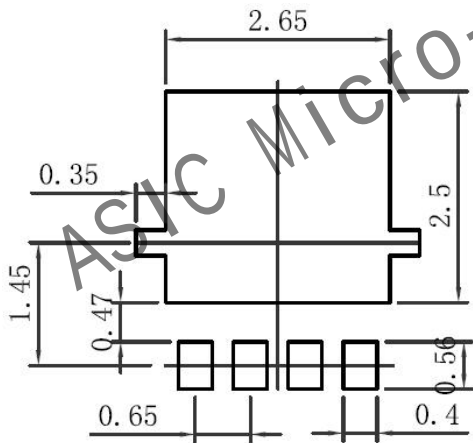
Dimension

PDFNWB3.3x3.3-8L



Symbol	Dimensions		Dimensions	
	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°

Recommended Land Pattern



Note:

- Controlling dimension: in millimeters
- General tolerance: $\pm 0.05\text{mm}$
- The pad layout is for reference only
- Unit: mm