

-40V -50A Advanced Trench PMOS

MOSFET Product Summary

V_{DS}	$R_{DS(ON)}$ (Typ.)	I_D
-40V	7.2m Ω @ $V_{GS}=-10V$	-50A
	11.8m Ω @ $V_{GS}=-4.5V$	

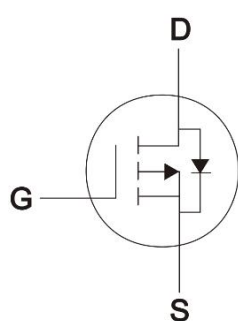
Description

The PM04P50D338 uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.

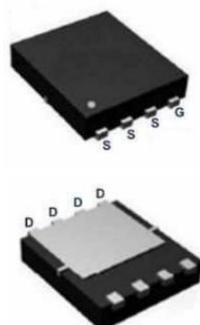
Features

- Advanced Trench Technology
- Super Low Gate Charge
- High Density Cell Design for Ultra Low $R_{DS(ON)}$
- RoHS Product

Dimensions and Pin Configuration



Circuit diagram

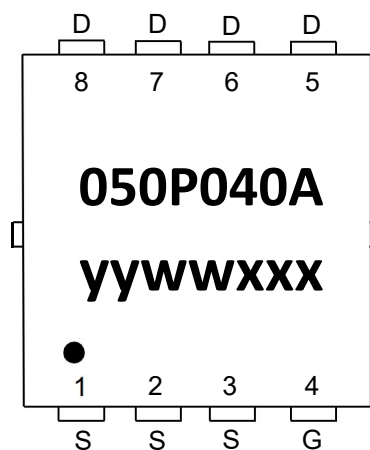


Outline

Applications

- Load Switching
- PWM
- DC/DC Converter
- High Frequency Switching

Marking Information



050P040A = Device Marking Code

yy = Year

ww = Week

xxx = Special Code

Ordering Information

Part Number	Shipping	Reel Size
PM04P50D338	5000/Tape & Reel	13 inch

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

Parameter		Symbol	Value	Unit
Drain to Source Voltage		V_{DS}	-40	V
Gate to Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous, Limited by T_{Vjmax}	$T_C = 25^{\circ}\text{C}$	I_D	-50	A
	$T_C = 100^{\circ}\text{C}$		-32	
Pulsed Drain Current ¹ , $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$		I_{DM}	-200	A
Diode Forward Current, Limited by T_{Vjmax} , $T_C = 25^{\circ}\text{C}$		I_S	-50	A
		I_{SM}	-200	
Avalanche energy, single pulse ^(Note2)		E_{AS}	212	mJ
Maximum Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_D	38	W
	$T_C = 100^{\circ}\text{C}$		15	
Maximum Soldering Temperature		T_{sold}	260	$^{\circ}\text{C}$
Operating Junction Temperature		T_J	-55~ +150	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^{\circ}\text{C}$

Notes:

1. Pulse width limited by maximum junction temperature

2. $T_J=25^{\circ}\text{C}$, $V_{DD}=-20\text{V}$, $L=1.0\text{mH}$, $R_g=25\Omega$

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.3	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient ^(Note3)	$R_{\theta JA}$	63	

Notes:

3. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain to Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-40	-	-	V
Zero Gate Voltage Drain Current	T _J =25℃	I _{DSS}	V _{DS} =-40V, V _{GS} =0V	-	-	-1	μA
	T _J =150℃			-	-	-100	
Gate to Source 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	-1.2	-1.8	-2.5	V
Drain to Source On-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-20A	-	7.2	9	mΩ
			V _{GS} =-4.5V, I _D =-15A	-	11.8	15	
Diode Forward Voltage		V _{SD}	V _{GS} =0V,I _S =-10A	-	-0.8	-1.4	V
Dynamic characteristics							
Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Capacitance		C _{iss}	V _{GS} =0V, V _{DS} =-20V, f=1MHz	-	1510	-	pF
Output Capacitance		C _{oss}		-	1077	-	
Reverse Transfer Capacitance		C _{rss}		-	70	-	
Gate Total Charge		Q _g	V _{GS} =-10V, V _{DS} =-20V, I _{DS} =-20A	-	24	-	nC
Gate-Source charge		Q _{gs}		-	4.4	-	
Gate-Drain charge		Q _{gd}		-	3.8	-	
Turn-on delay time		t _{d(on)}	V _{GS} =-10V, V _{DD} =-20V, R _G =3Ω, I _D =-20A	-	5.6	-	ns
Rise time		t _r		-	13	-	
Turn-off delay time		t _{d(off)}		-	47	-	
Fall time		t _f		-	26	-	
Reverse Recovery Time		t _{rr}	I _F =-20A,di/dt=100A/μs	-	38	-	ns
Reverse Recovery Charge		Q _{rr}		-	25	-	nC

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

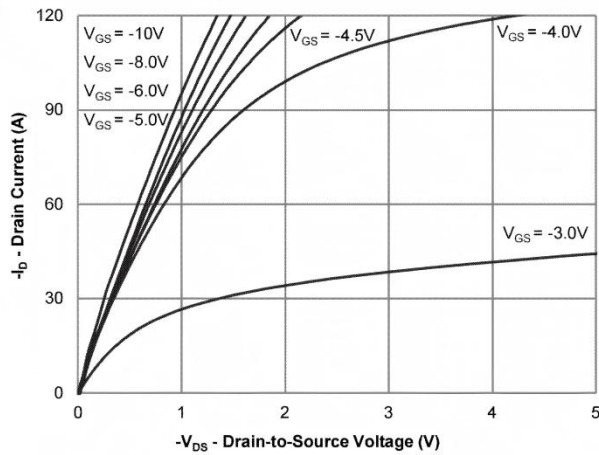


Figure 1: Output Characteristics

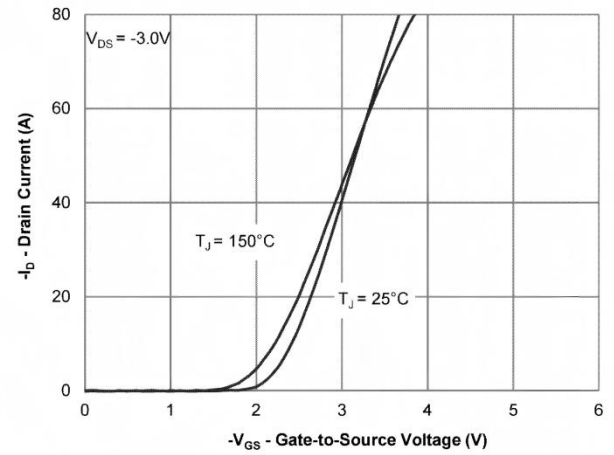


Figure 2: Transfer Characteristics

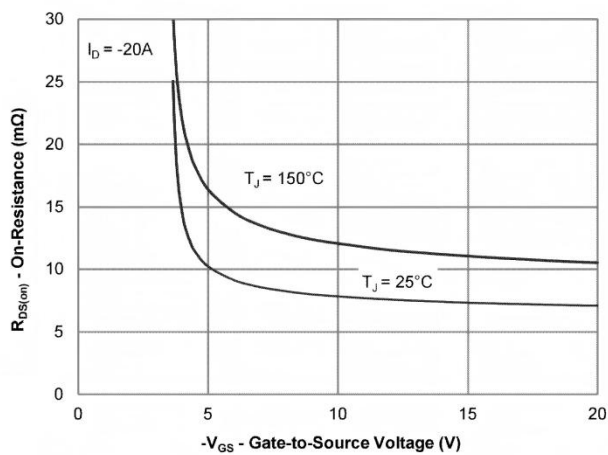


Figure 3: On-Resistance vs. Gate-Source Voltage

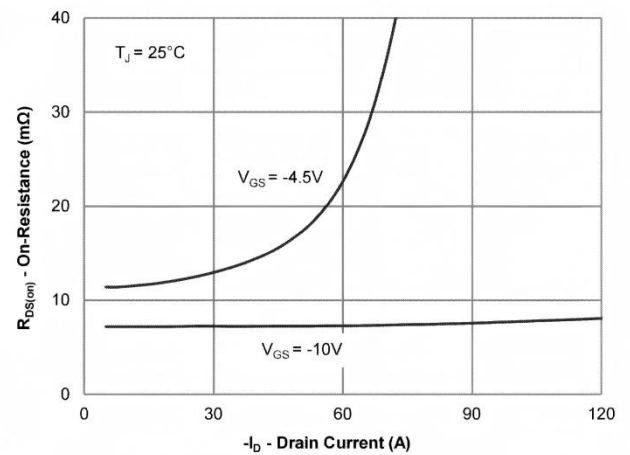


Figure 4: On-Resistance vs. Drain Current and Gate Voltage

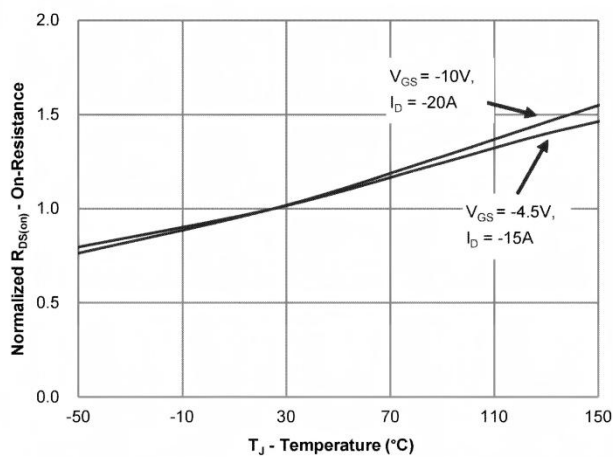


Figure 5: On-Resistance vs. Junction Temperature

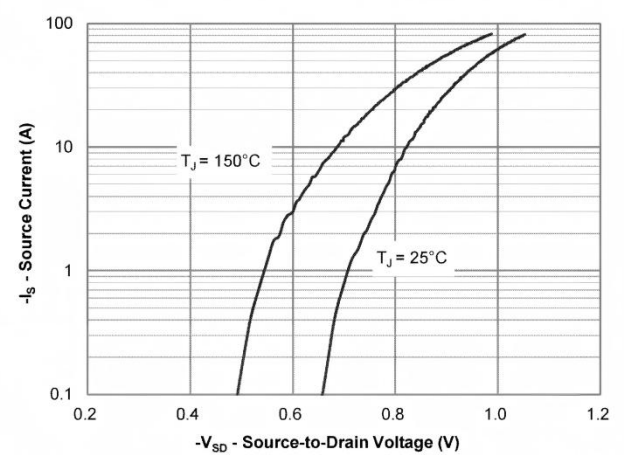
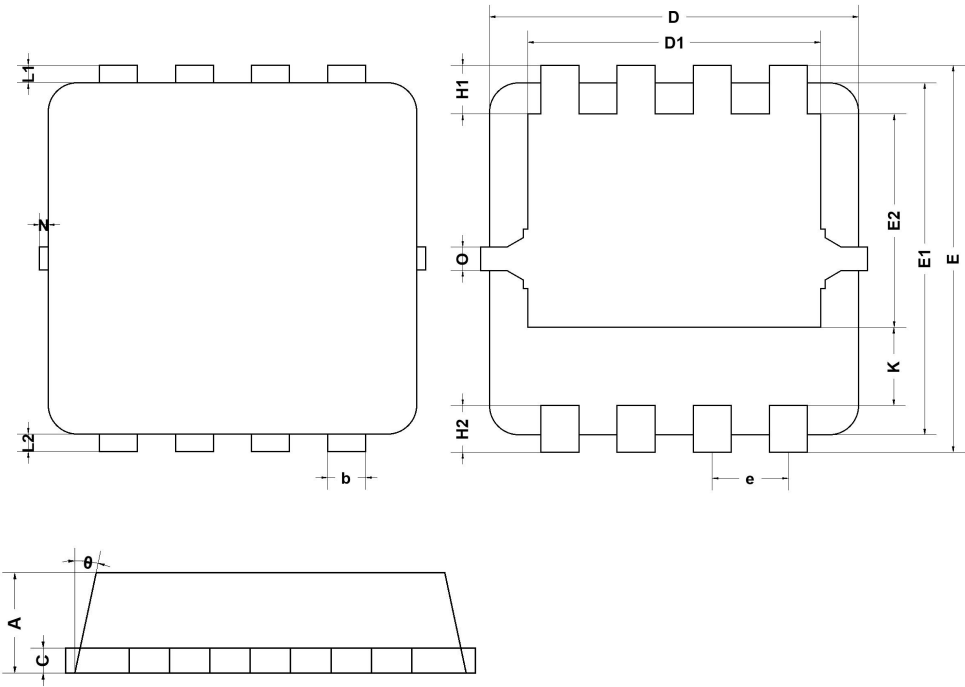


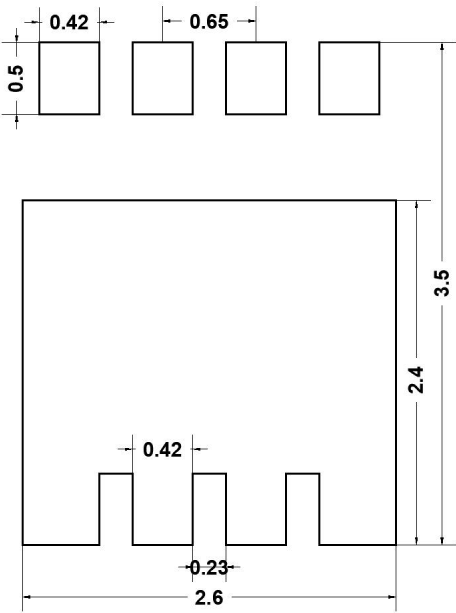
Figure 6: Source-Drain Diode Forward Voltage

PDFN3.3*3.3-8L Package Outline Drawing



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	-	0.90
b	0.25	0.40
C	0.15	0.25
D	3.05	3.25
D1	2.35	2.75
E	3.20	3.45
E1	2.90	3.20
E2	1.52	1.92
e	0.65BSC	
H1	0.31	0.52
H2	0.25	0.50
K	0.67	0.96
L1/L2	0.05	0.23
θ	8°	13°
N	0.00	0.15
O	0.2REF	

Suggested Land Pattern (Unit: mm)



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