

Product Summary

V _{(BR)DSS}	R _{DS(on)TYP}	I _D
-20V	17mΩ@-4.5V	-20A
	22mΩ@-2.5V	
	31mΩ@-1.8V	

Feature

- Trench Technology Power MOSFET
- Low R_{DS(ON)}
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

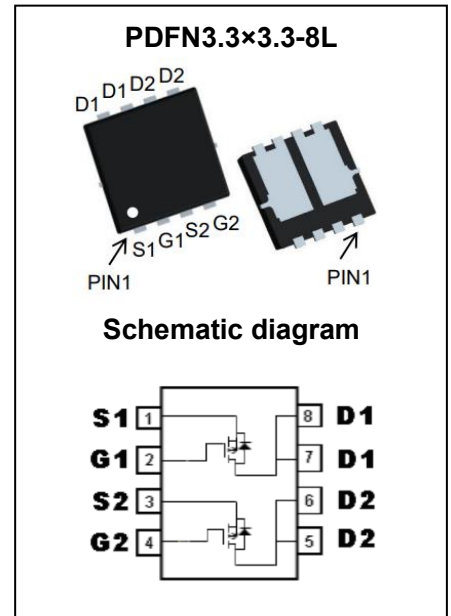
Application

- Power Switching Application

MARKING:



M170PD02U = Device Code
 XX = Date Code
 Solid Dot = Green Indicator



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V _{DS}	-20	V
Gate - Source Voltage	V _{GS}	±12	V
Continuous Drain Current ¹	T _C = 25°C	I _D	-20
	T _C = 100°C	I _D	-14
Pulsed Drain Current ²	I _{DM}	-80	A
Single Pulsed Avalanche Current ³	I _{AS}	-18.5	A
Single Pulsed Avalanche Energy ³	E _{AS}	86.6	mJ
Power Dissipation ⁵	T _C = 25°C	P _D	24
Thermal Resistance from Junction to Ambient ⁶	R _{θJA}	60	°C/W
Thermal Resistance from Junction to Case	R _{θJC}	5.2	°C/W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55~ +150	°C

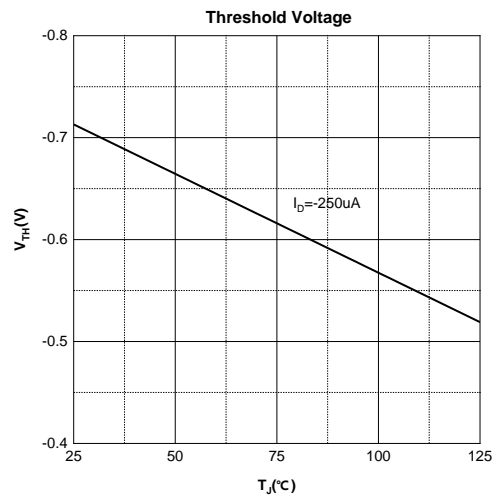
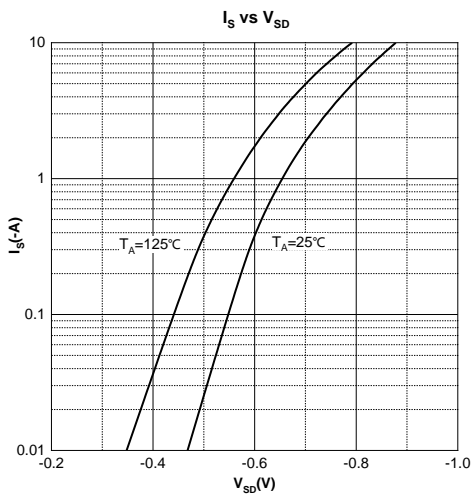
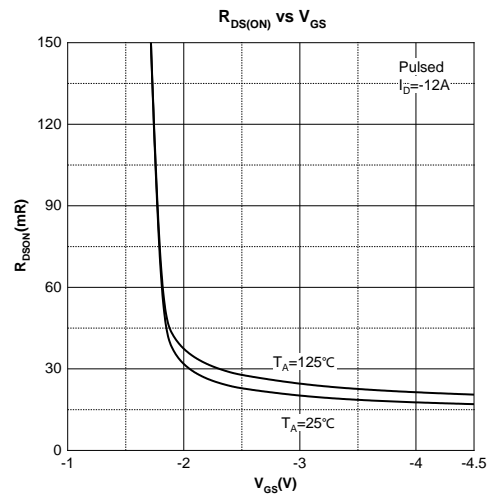
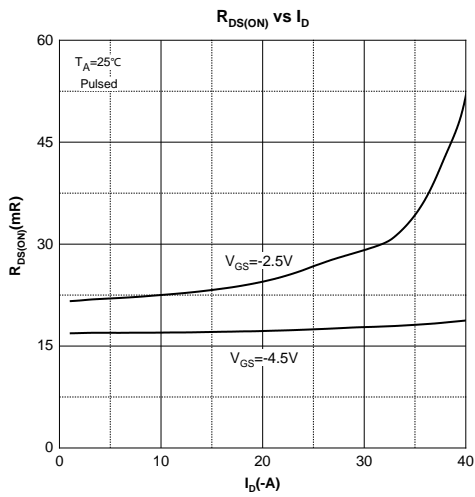
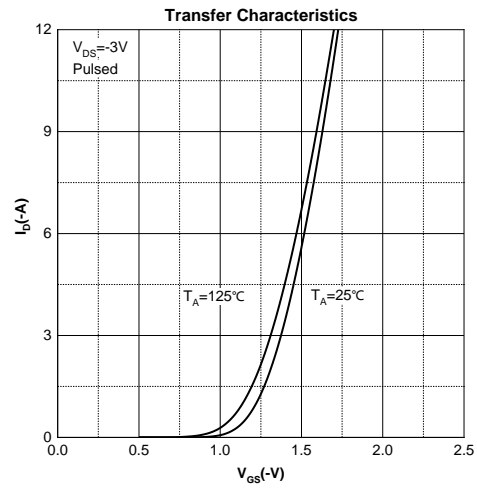
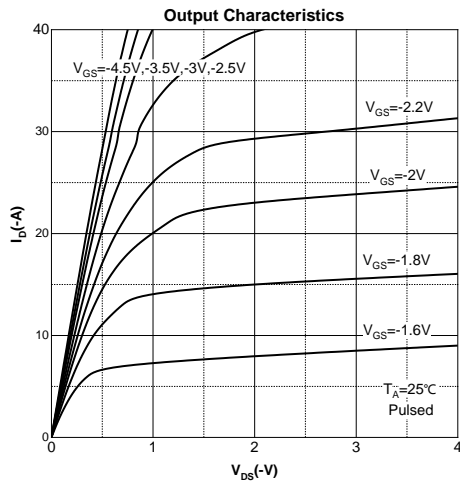
MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
On Characteristics⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -6A$		17	22	m Ω
		$V_{GS} = -2.5V, I_D = -5A$		22	29	
		$V_{GS} = -1.8V, I_D = -1A$		31	40	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$		2653		pF
Output Capacitance	C_{oss}			253		
Reverse Transfer Capacitance	C_{rss}			227		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		13.2		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -6A$		25.7		nC
Gate-source Charge	Q_{gs}			4.2		
Gate-drain Charge	Q_{gd}			6		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, I_D = -5.1A, R_G = 3\Omega$		11		ns
Turn-on Rise Time	t_r			9		
Turn-off Delay Time	$t_{d(off)}$			25		
Turn-off Fall Time	t_f			11.5		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = -1A$			-1.2	V

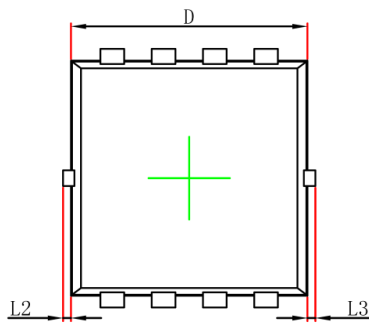
Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = -15V, V_{GS} = -10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.And device mounted on a large heatsink
- 6.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

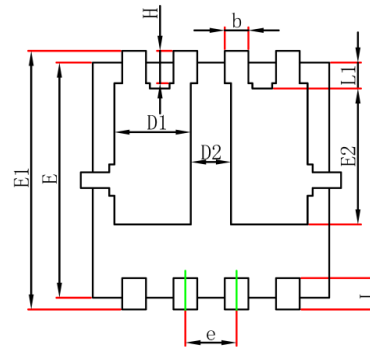
Typical Characteristics



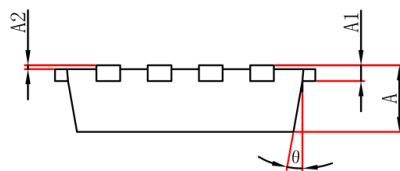
PDFN3.3×3.3-8L Package Information



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	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.200	0.114	0.126
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	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
θ	0°	12°	0°	12°