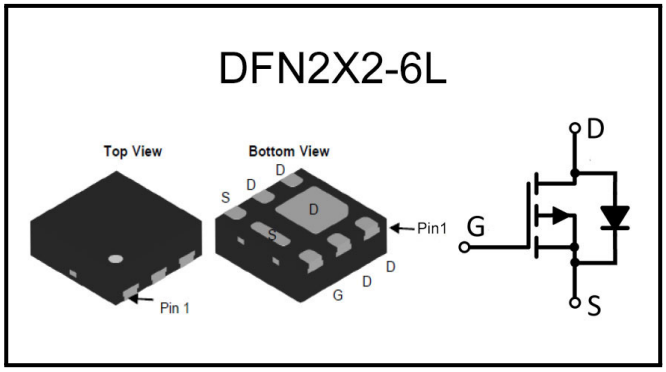
BM20P12A

P-Channel Enhancement Mode Power MOSFET

Features

- V_{DS}=-20V,I_D=-12A
- $R_{DS(ON)}$ @V_{GS}=-2.5V, TYP=20mΩ
- $R_{DS(ON)}$ @V_{GS}=-4.5V, TYP=17mΩ
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Package



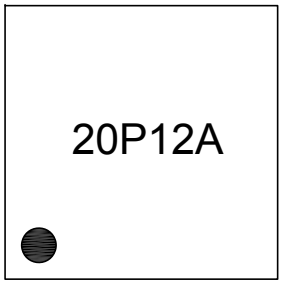
Description

The BM20P12A uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and high density cell Design for ultra low on-resistance. This device is suitable for use as a load switch or in PWM applications.

Application

- PWM applications
- Load switch

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BM20P12A	DFN2x2-6L	20P12A	3K	Tape and reel

Thermal Characteristics

Symbol	Parameter		Typ.	Max.	Unit
R_{thJA}	Maximum Junction-to-Ambient	t ≤ 5s	28	36	°C/W
R_{thJC}	Maximum Junction-to-case(drain)	Steady State	5.3	6.5	

BM20P12A

P-Channel Enhancement Mode Power MOSFET

Absolute Maximum Ratings (@T_A=25°C unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-Source Voltage		-20	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current	T_C=25°C	-12 (1)	A
		T_C=70°C	-8.4 (1)	
		T_A=25°C	-12 (1)(2)(3)	
		T_A=70°C	-7(2)(3)	
I_S	Drain-source Diode forward current	T_C=25°C	-12(1)	A
		T_A=25°C	-2.9(2)(3)	
P_D	Maximum Power Dissipation	T_C=25°C	18	W
		T_C=70°C	12	
		T_A=25°C	3.5(2)(3)	
		T_A=70°C	2.2(2)(3)	
T_J	Operating junction Temperature range		-55 to 150	°C

Note(1):Package limited.

(2): Surface mounted on 1” x 1” FR4 board.

(3): t = 5 s.

(4): Maximum under steady state conditions is 80 °C/W.

BM20P12A

P-Channel Enhancement Mode Power MOSFET

Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV_{DS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D =-250uA	-20	–	–	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -20V, V_{GS} = 0V	–	–	-1.0	uA
I_{GSS}	Gate Leakage Current	V_{GS} = ±12V,V_{DS} =0V	–	–	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250uA	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS} = -4.5V, I_D = -5.0A	–	17	22	mΩ
		V_{GS} = -2.5V, I_D = -4.0A	–	20	30	
gfs	Forward transconductance	V_{DS} = -10V, I_D = -5A	–	20	–	S
Dynamic						
C_{iss}	Input Capacitance	V_{DS} = -10V,	–	1500	–	pF
C_{oss}	Output Capacitance	V_{GS} = 0V,	–	233	–	
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHZ	–	198	–	
Switching						
$t_{d(on)}$	Turn-On Delay Time	V_{GEN} = -4.5V,I_D=-5A	–	10	–	ns
t_r	Turn-On Rise Time	V_{DD} = -10V,	–	31	–	
$t_{d(off)}$	Turn-Off Delay Time	R_L =1.2Ω	–	28	–	
t_f	Turn-Off Fall Time	R_{GEN} =1Ω	–	8	–	
Q_g	Total Gate Charge	V_{DS} =-10V	–	15.3	–	nC
Q_{gs}	Gate-Source Charge	V_{GS} = -4.5V ,	–	2.2	–	
Q_{gd}	Gate-Drain Charge	I_D =-6A	–	4.4	–	
Drain-source Body diode characteristics						
V_{SD}	Diode Forward Voltage	I_S = -1.25A,V_{GS} = 0V,	–	-0.7	-1.2	V

Note(1):Pulse test: Pulse width 300 μs, duty cycle 2 %.

(2): Guaranteed by design, not subject to production testing.

BM20P12A

P-Channel Enhancement Mode Power MOSFET

Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 1 :Output Characteristics

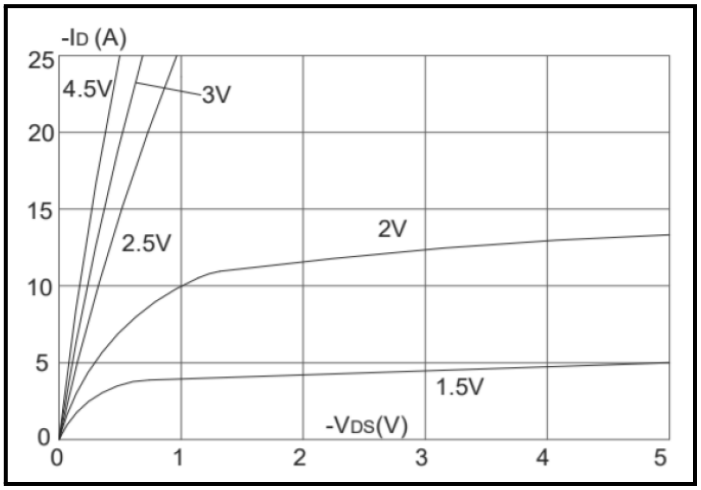


Figure 2 :Typical Transfer Characteristics

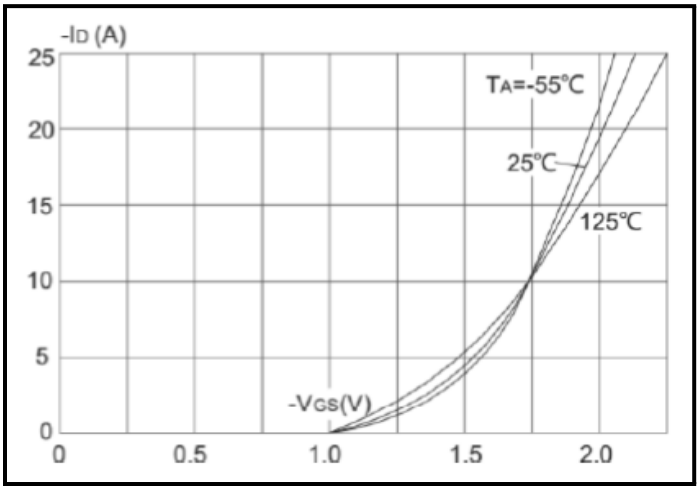


Figure 3 :On-resistance vs. Drain Current

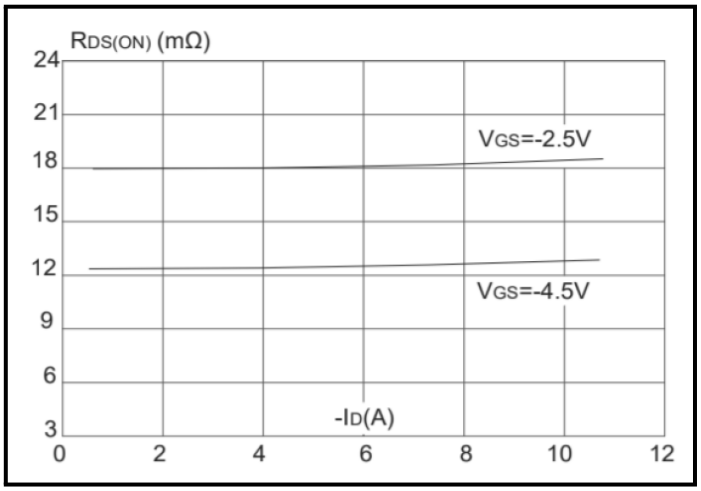


Figure 4 :Body Diode Characteristics

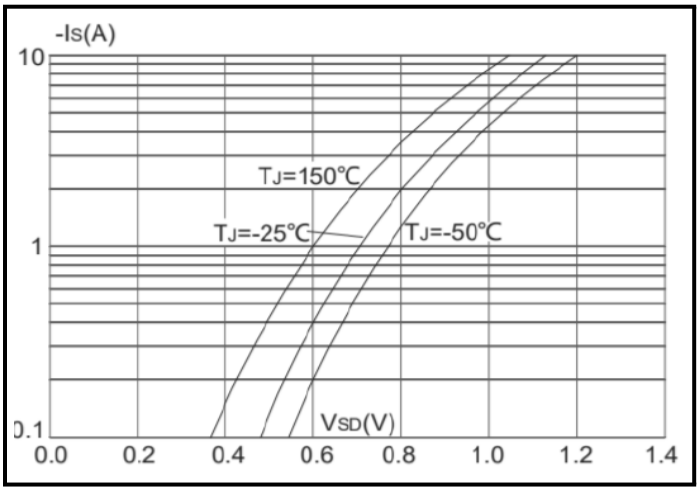


Figure 5 :Gate Charge Characteristics

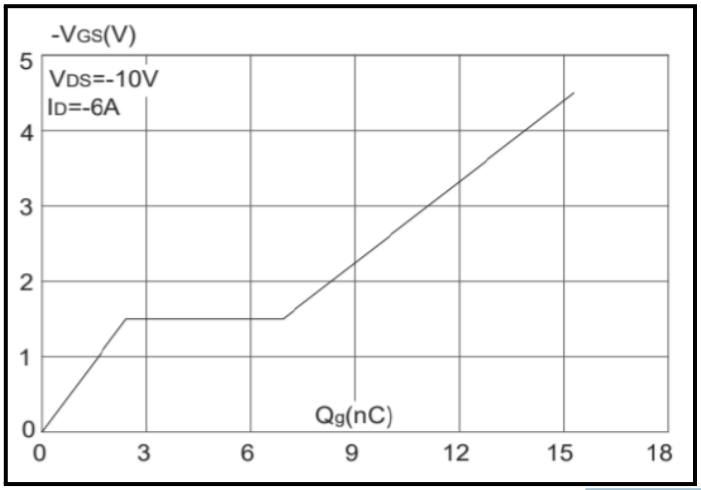
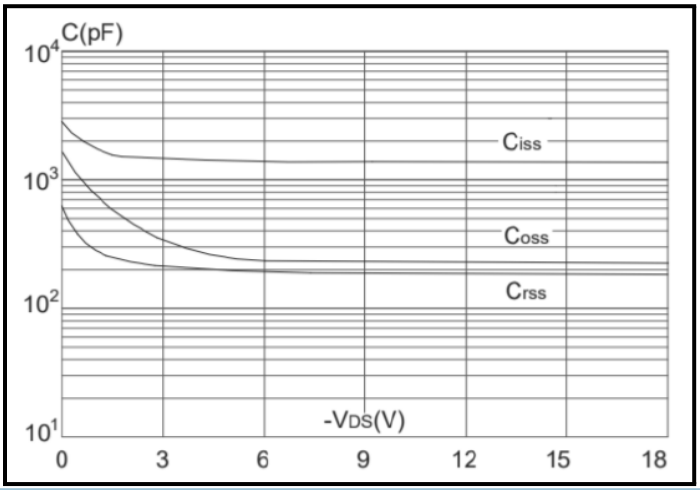


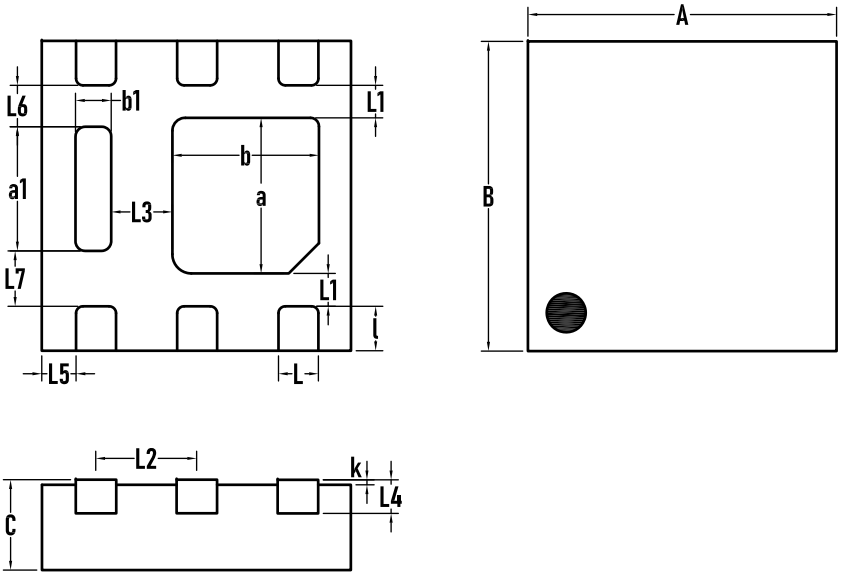
Figure 6 :Capacitance Characteristics



BM20P12A

P-Channel Enhancement Mode Power MOSFET

Outline Drawing - DFN2x2-6L



SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	1.95	2.00	2.05
B	1.95	2.00	2.05
C	0.45	0.50	0.55
L	0.25	0.30	0.35
L1	0.10	0.20	0.30
L2	–	0.65	–
L3	0.30	0.40	0.50
L4	–	0.152	–
L5	0.12	0.22	0.32
L6	0.15	0.25	0.35
L7	0.23	0.33	0.43
a	0.90	1.00	1.10
a1	0.72	0.82	0.92
b	0.85	0.95	1.05
b1	0.13	0.23	0.33
l	0.25	0.30	0.35
k	0.00	–	0.05