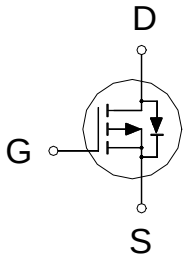
杰力科技股份有限公司
Excelliance MOS Corporation

EMB12P03H

P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	-30V
$R_{DSON\ (MAX.)}$	12mΩ
I_D	-50A



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	-50	A
	T_C = 100 °C		-36	
Pulsed Drain Current[1]		I_{DM}	-120	
Avalanche Current		I_{AS}	-20	
Avalanche Energy	L = 0.1mH, I_D=-20A, R_G=25Ω	E_{AS}	20	mJ
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 100 °C		20	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		2.5	°C / W
Junction-to-Ambient[3]	$R_{\theta JA}$		50	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

[3]50°C / W when mounted on a 1 in^2 pad of 2 oz copper.

ELECTRICAL CHARACTERISTICS (T_C = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.5	-3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24V, V_{GS} = 0V			-1	μA
		V_{DS} = -20V, V_{GS} = 0V, T_J = 125 °C			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-50			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -20A		10.5	12	mΩ
		V_{GS} = -4.5V, I_D = -10A		15	20	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -20A		30		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz		2363		pF
Output Capacitance	C_{oss}			385		
Reverse Transfer Capacitance	C_{rss}			326		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		4.0		Ω
Total Gate Charge[1,2]	Q_g	V_{DS} = -15V, V_{GS} = -10V, I_D = -20A		45		nC
Gate-Source Charge[1,2]	Q_{gs}			5.6		
Gate-Drain Charge[1,2]	Q_{gd}			8.5		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = -15V, I_D = -1A, V_{GS} = -10V, R_{GS} = 2.7Ω		15		nS
Rise Time[1,2]	t_r			12		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			35		
Fall Time[1,2]	t_f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				-50	A
Pulsed Current[3]	I_{SM}				-120	
Forward Voltage[1]	V_{SD}	I_F = -20A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F = I_S, dI_F/dt = 100A / μS		32		nS
Reverse Recovery Charge	Q_{rr}			26		nC

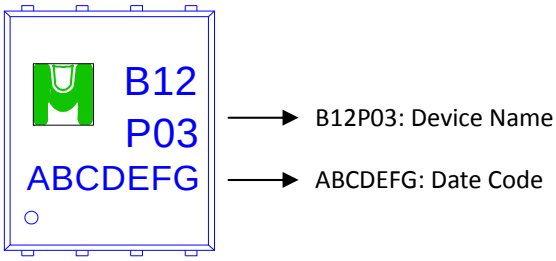
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

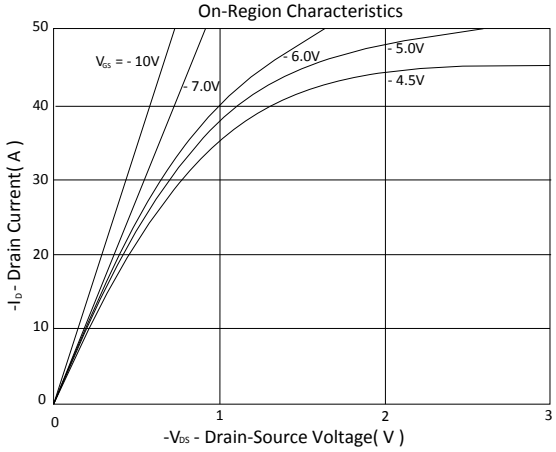
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

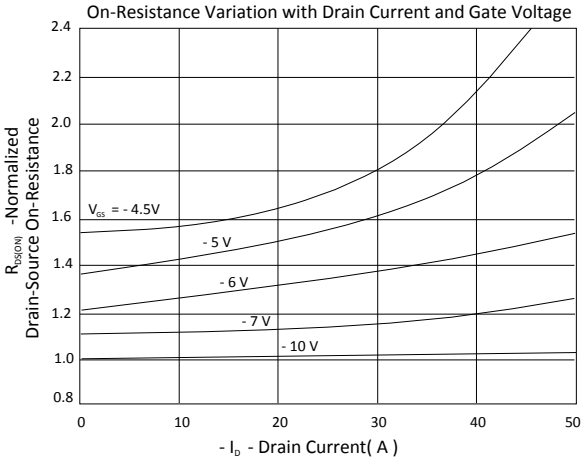
Device Name: EMB12P03H for EDFN 5 x 6



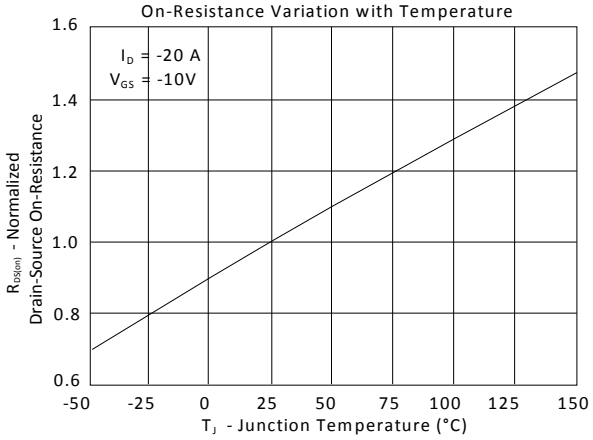
On-Region Characteristics



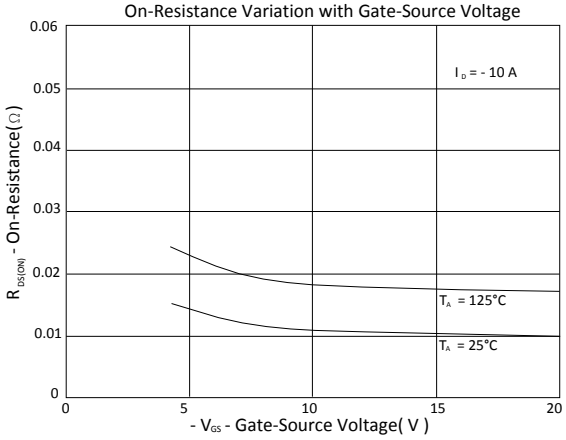
On-Resistance Variation with Drain Current and Gate Voltage



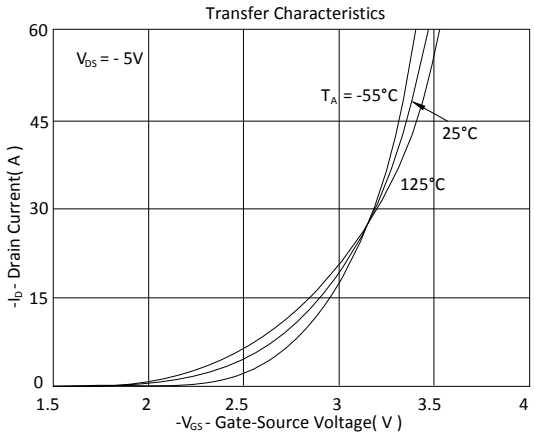
On-Resistance Variation with Temperature



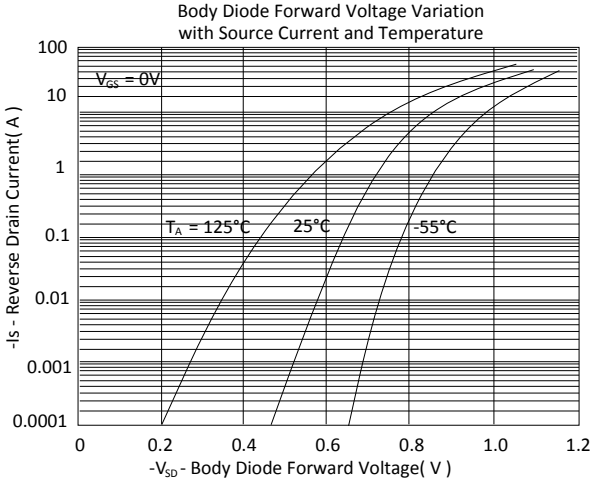
On-Resistance Variation with Gate-Source Voltage

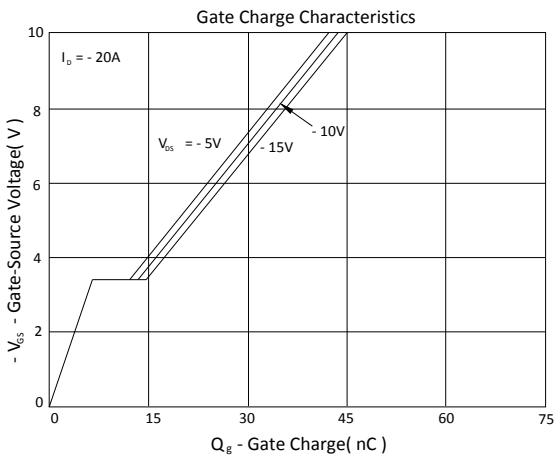


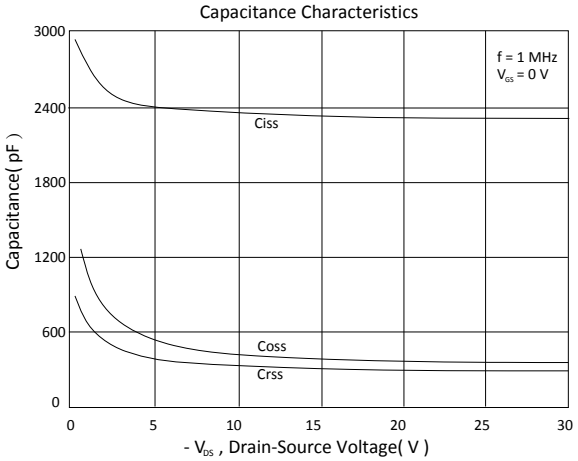
Transfer Characteristics

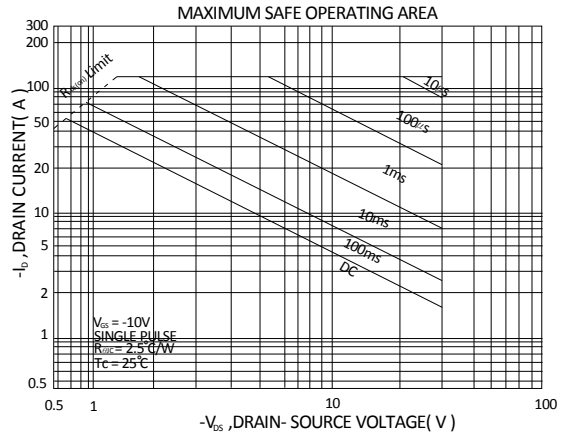


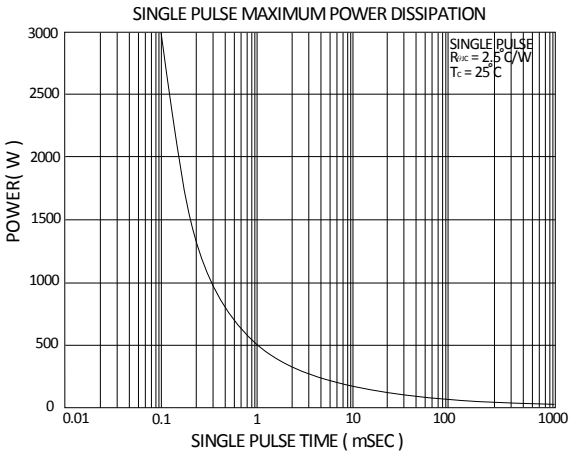
Body Diode Forward Voltage Variation with Source Current and Temperature

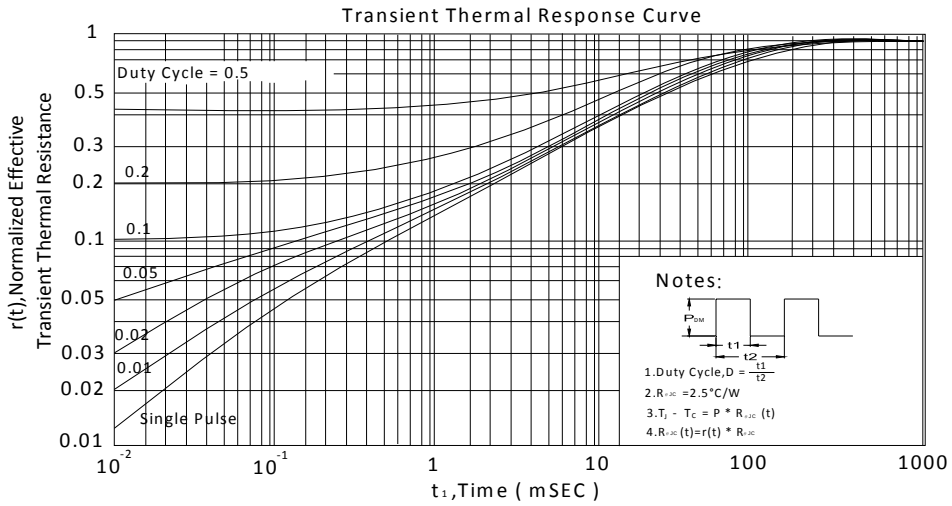



Gate Charge Characteristics
I_D = - 20A
V_DS = - 5V
- 10V
- 15V
- V_GS - Gate-Source Voltage(V)
Q_g - Gate Charge(nC)

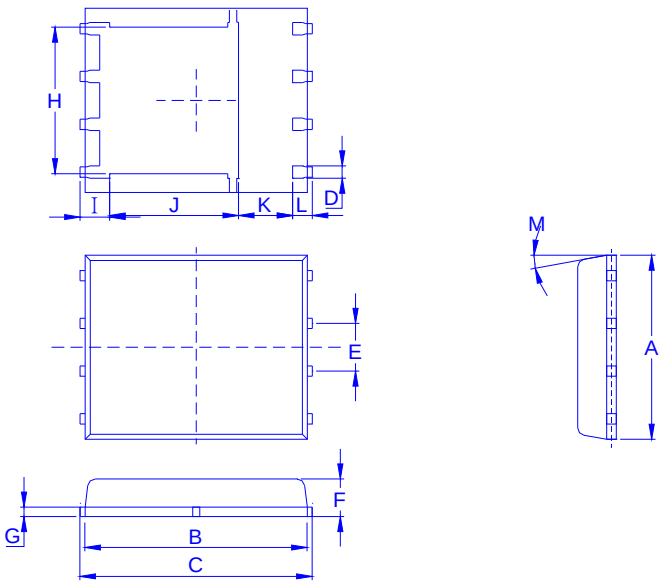

Capacitance Characteristics
f = 1 MHz
V_GS = 0 V
Ciss
Coss
Crss
Capacitance(pF)
- V_DS , Drain-Source Voltage(V)


MAXIMUM SAFE OPERATING AREA
R_DS(on) Limit
10μs
100μs
1ms
10ms
100ms
DC
V_GS = -10V
SINGLE PULSE
R_θJC = 2.5°C/W
Tc = 25°C
-I_D ,DRAIN CURRENT(A)
-V_DS ,DRAIN- SOURCE VOLTAGE(V)


SINGLE PULSE MAXIMUM POWER DISSIPATION
SINGLE PULSE
R_θJC = 2.5°C/W
Tc = 25°C
POWER(W)
SINGLE PULSE TIME (mSEC)


Transient Thermal Response Curve
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Notes:
P_DM
t1
t2
1.Duty Cycle,D = t1/t2
2.R_θJC =2.5°C/W
3.T_J - T_C = P * R_θJC (t)
4.R_θJC (t)=r(t) * R_θJC
r(t),Normalized Effective Transient Thermal Resistance
t1 ,Time (mSEC)

Outline Drawing



Dimension in mm

Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M
Min.	4.80	5.50	5.90	0.3		0.85	0.15	3.67	0.41	3.00	0.94	0.45	0°
Typ.					1.27								
Max.	5.30	5.90	6.15	0.51		1.20	0.30	4.54	0.85	3.92	1.7	0.71	12°

Recommended minimum pads