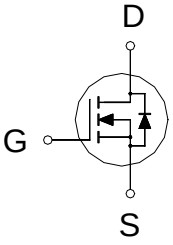
杰力科技股份有限公司
Excelliance MOS Corporation

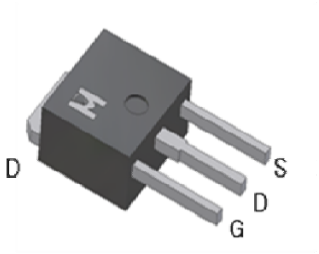
EMBJ0N20CS

N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	200V
$R_{DSON\ (MAX.)}$	1Ω
I_D	3.5A





UIS, 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	3.5	A
	T_C = 100 °C		2.3	
Pulsed Drain Current[1]		I_{DM}	14	
Avalanche Current		I_{AS}	1.5	
Avalanche Energy	L = 1mH, ID=1.5A, RG=25Ω	E_{AS}	1.12	mJ
Repetitive Avalanche Energy[2]	L = 0.5mH	E_{AR}	0.56	
Power Dissipation	T_C = 25 °C	P_D	29	W
	T_C = 100 °C		11	
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	$R_{\theta JC}$		4.2	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

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	200			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	2	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 160V, V_{GS} = 0V			1	μA
		V_{DS} = 130V, V_{GS} = 0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	3.5			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 1.8A		0.8	1	Ω
		V_{GS} = 5V, I_D = 1.0A		1.1	1.4	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 1.8A		2		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		618		pF
Output Capacitance	C_{oss}			14		
Reverse Transfer Capacitance	C_{rss}			12		
Total Gate Charge[1,2]	Q_g	V_{DS} = 100V, V_{GS} = 10V, I_D = 1.8A		16.5		nC
Gate-Source Charge[1,2]	Q_{gs}			2.1		
Gate-Drain Charge[1,2]	Q_{gd}			4.2		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 100V, I_D = 1A, V_{GS} = 10V, R_{GS} = 6Ω		15		nS
Rise Time[1,2]	t_r			50		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			15		
Fall Time[1,2]	t_f			35		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				3.5	A
Pulsed Current[3]	I_{SM}				14	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.5	V

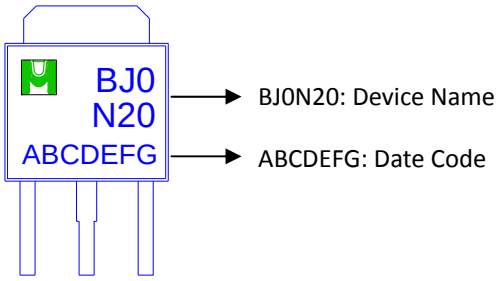
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

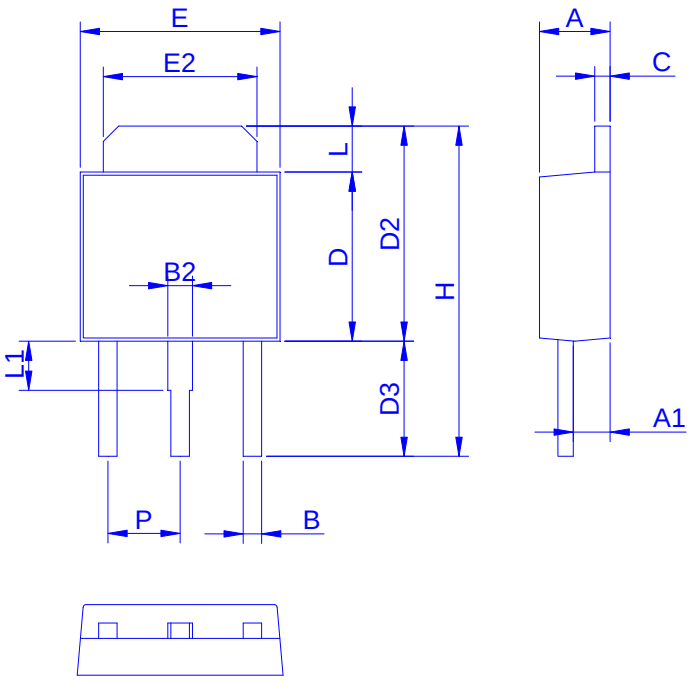
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMBJ0N20CS for IPAK (TO-251)



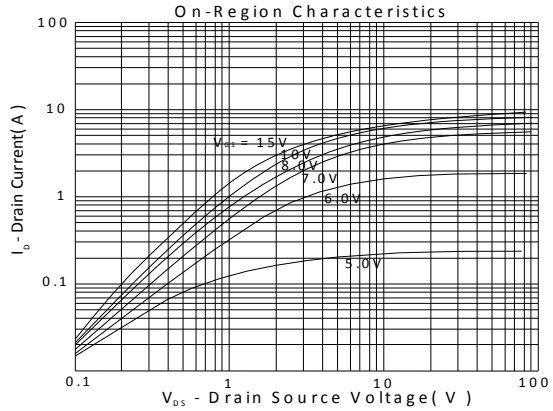
Outline Drawing

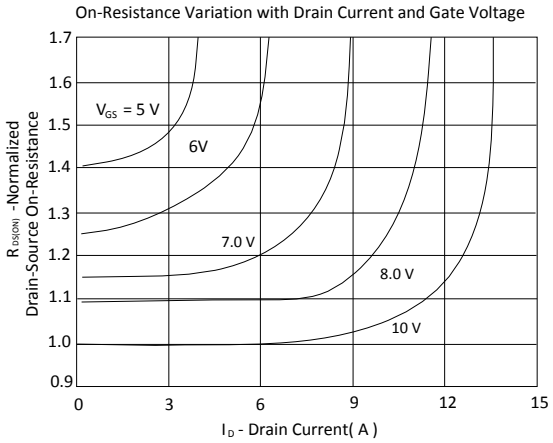


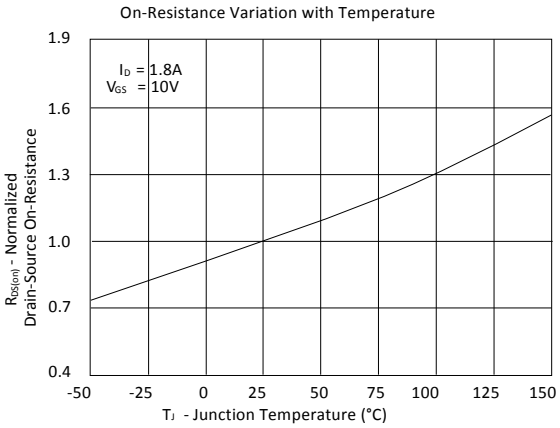
Dimension in mm

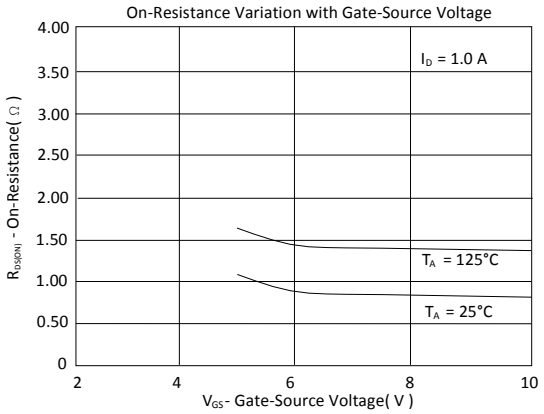
Dimension	A	A1	B	B2	C	D	D2	D3	E	E2	H	L	L1	P
Min.	2.10	0.90	0.40	0.60	0.40	5.30	6.70	3.40	6.30	4.80	10.2	0.89	0.90	2.10
Max.	2.50	1.50	0.90	1.15	0.60	6.25	7.30	4.30	6.80	5.50	11.5	1.40	1.80	2.50

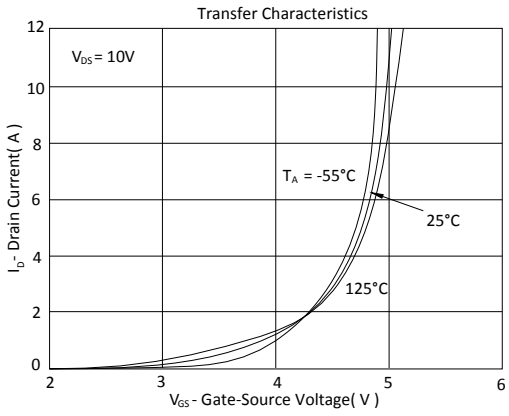
TYPICAL CHARACTERISTICS

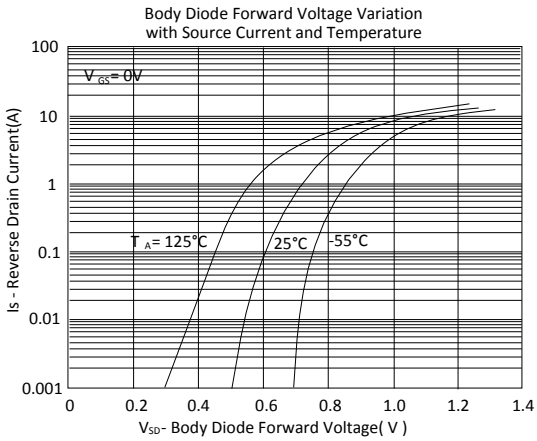


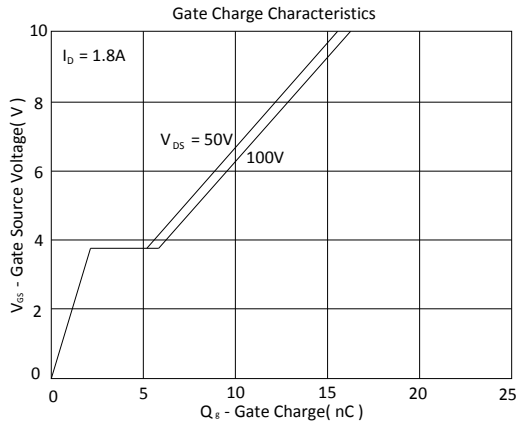


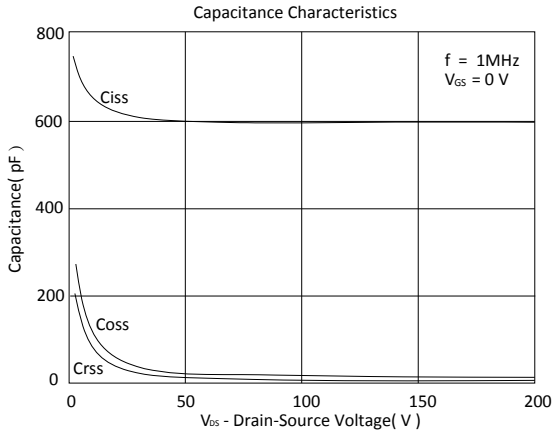


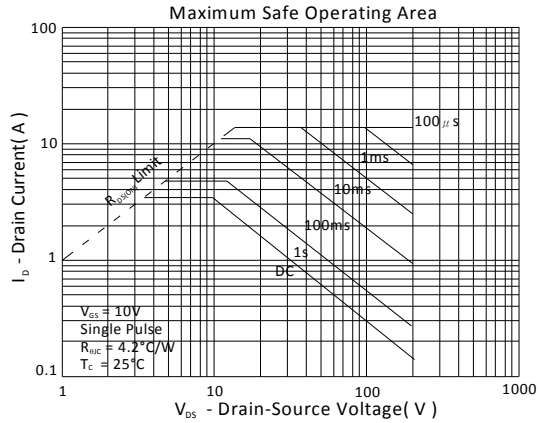


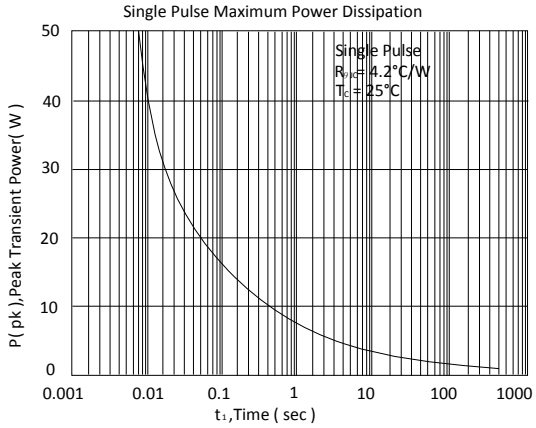


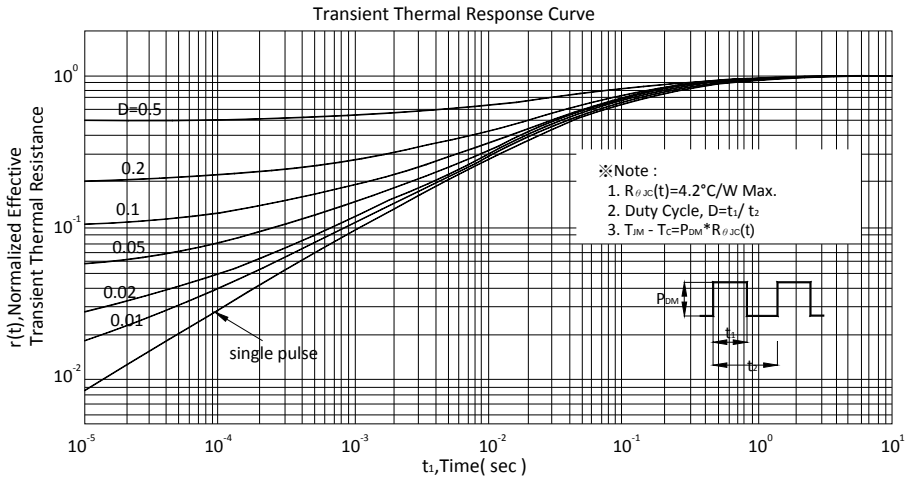



Gate Charge Characteristics
I_D = 1.8A
V_{DS} = 50V
100V
V_{GS} - Gate Source Voltage(V)
Q_g - Gate Charge(nC)


Capacitance Characteristics
f = 1MHz
V_{GS} = 0 V
Ciss
Coss
Crss
Capacitance(pF)
V_{DS} - Drain-Source Voltage(V)


Maximum Safe Operating Area
100μs
1ms
10ms
100ms
1s
DC
$R_{DS(ON)}$ Limit
V_{GS} = 10V
Single Pulse
$R_{\theta JC}$ = 4.2°C/W
T_C = 25°C
I_D - Drain Current(A)
V_{DS} - Drain-Source Voltage(V)


Single Pulse Maximum Power Dissipation
Single Pulse
$R_{\theta JC}$= 4.2°C/W
T_C = 25°C
P(pk),Peak Transient Power(W)
t_1 ,Time (sec)


Transient Thermal Response Curve
D=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
※Note :
1. $R_{\theta JC}$(t)=4.2°C/W Max.
2. Duty Cycle, D=t_1/ t_2
3. T_{JM} - T_C=P_{DM}*$R_{\theta JC}$(t)
P_{DM}
t_1
t_2
r(t),Normalized Effective Transient Thermal Resistance
t_1,Time(sec)