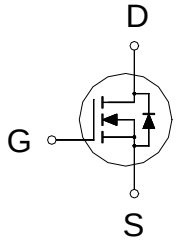
杰力科技股份有限公司
Excelliance MOS Corporation

EMB07N03V

N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	30V
$R_{DSON\ (MAX.)}$	7mΩ
I_D	24A



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

ABSOLUTE MAXIMUM RATINGS (T_A = 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	24	A
	T_C = 100 °C		17	
Pulsed Drain Current[1]		I_{DM}	96	
Avalanche Current		I_{AS}	15	
Avalanche Energy	L = 0.1mH, ID=15A, RG=25Ω	E_{AS}	11.25	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	5.62	
Power Dissipation	T_C = 25 °C	P_D	25	W
	T_C = 100 °C		8	
Power Dissipation	T_A = 25 °C	P_D	2.5	W
	T_A = 100 °C		1	
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	$R_{\theta JC}$		6	°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_J = 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			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	24			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 14A		5.5	7	mΩ
		V_{GS} = 4.5V, I_D = 10A		6.5	9	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 14A		25		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		1014		pF
Output Capacitance	C_{oss}			163		
Reverse Transfer Capacitance	C_{rss}			93		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		2.5		Ω
Total Gate Charge[1,2]	$Q_g(V_{GS}=10V)$	V_{DS} = 15V, V_{GS} = 10V, I_D = 14A		15		nC
	$Q_g(V_{GS}=4.5V)$			8.5		
Gate-Source Charge[1,2]	Q_{gs}			3.3		
Gate-Drain Charge[1,2]	Q_{gd}			3.5		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 15V, I_D = 1A, V_{GS} = 10V, R_{GS} = 6Ω		10		nS
Rise Time[1,2]	t_r			10		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			20		
Fall Time[1,2]	t_f			15		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				4	A
Pulsed Current[3]	I_{SM}				16	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = I_S, dI_F/dt = 100A / μS		20		nS
Peak Reverse Recovery Current	$I_{RM(REC)}$			40		A
Reverse Recovery Charge	Q_{rr}			11		nC

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

[2]Independent of operating temperature.

[3]Pulse width limited by maximum junction temperature.

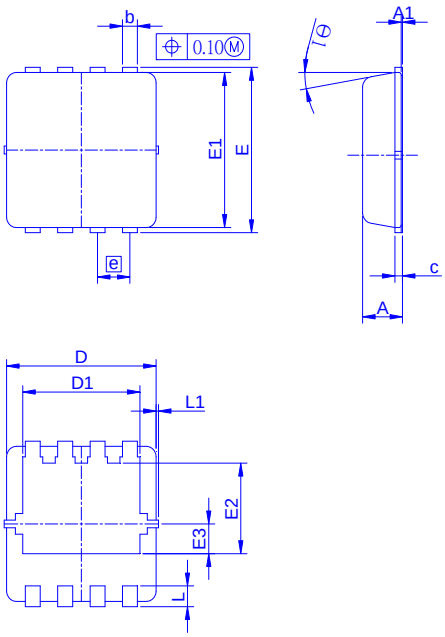
Ordering & Marking Information:

Device Name: EMB07N03V for EDFN 3 x 3

B07N03: Device Name

ABCDEFG: Date Code

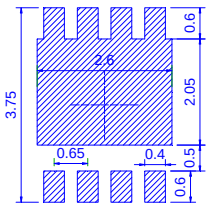
Outline Drawing

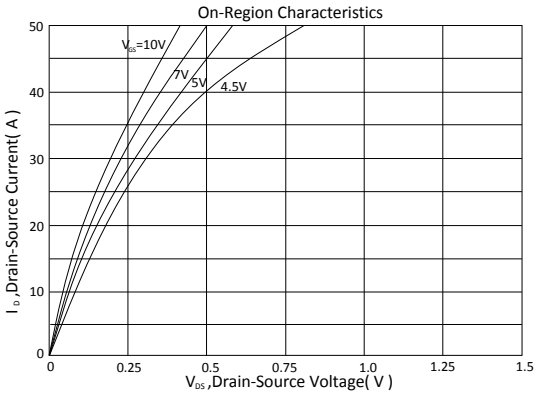


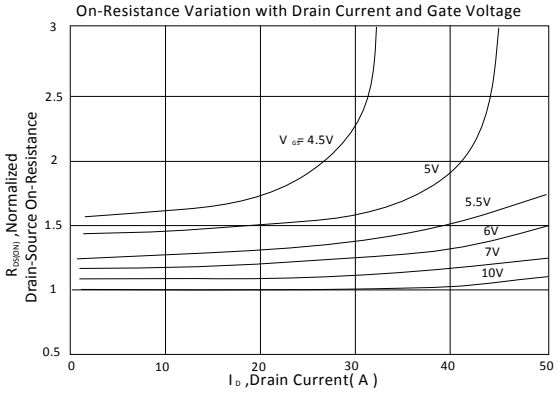
Dimension in mm

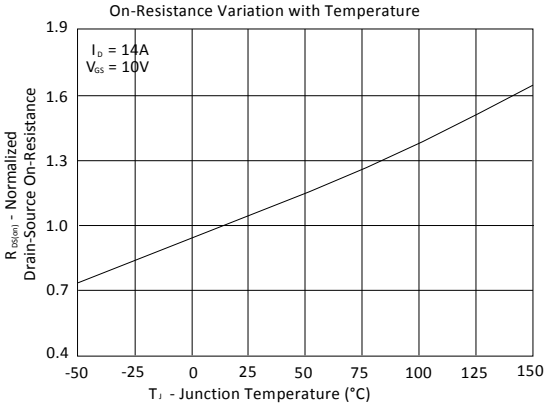
Dimension	A	A1	b	c	D	D1	E	E1	E2	E3	e	L	L1	Θ1
Min.	0.70	0	0.24	0.10	2.95	2.25	3.15	2.95	1.65			0.30		0°
Typ.	0.80		0.30	0.152	3.00	2.35	3.20	3.00	1.75	0.575	0.65	0.40	0.13	10°
Max.	0.90	0.05	0.37	0.25	3.15	2.45	3.40	3.15	1.96			0.50		12°

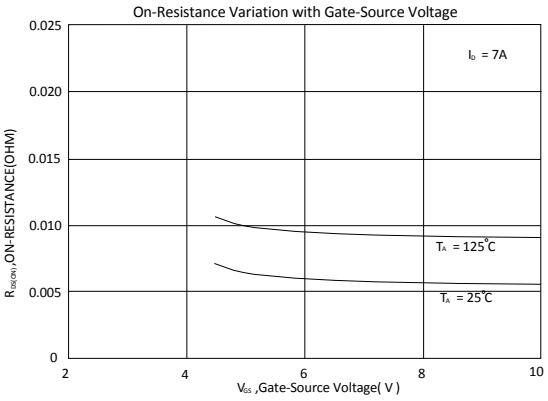
Recommended minimum pads

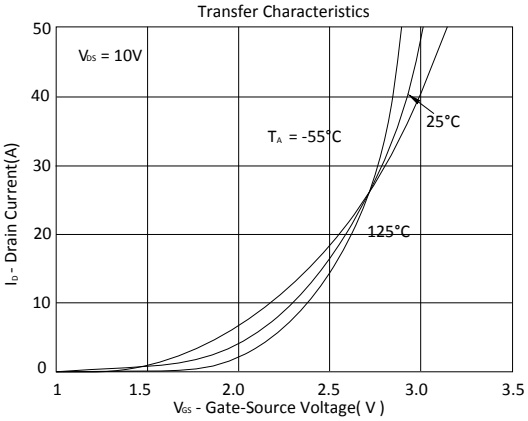


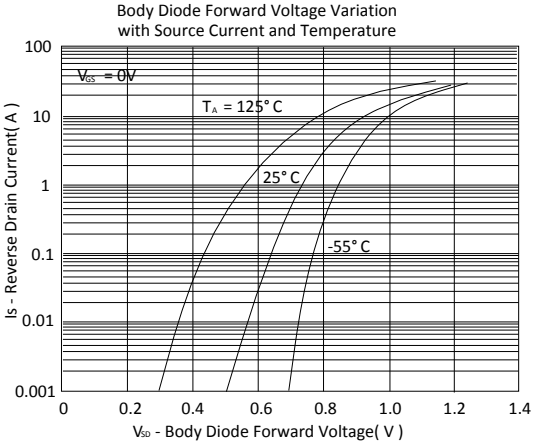

On-Region Characteristics
V_{GS}=10V
7V
5V
4.5V
I_D ,Drain-Source Current(A)
V_{DS} ,Drain-Source Voltage(V)

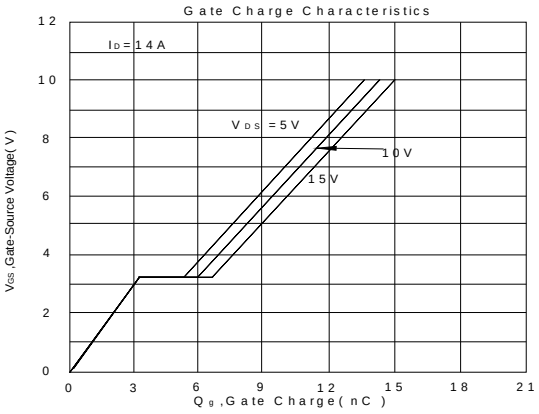

On-Resistance Variation with Drain Current and Gate Voltage
V GS= 4.5V
5V
5.5V
6V
7V
10V
$R_{DS(ON)}$,Normalized Drain-Source On-Resistance
I_D ,Drain Current(A)

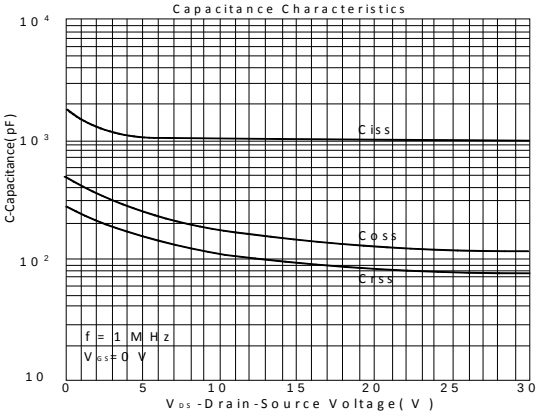

On-Resistance Variation with Temperature
I_D = 14A
V_{GS} = 10V
$R_{DS(on)}$ - Normalized Drain-Source On-Resistance
T_J - Junction Temperature (°C)

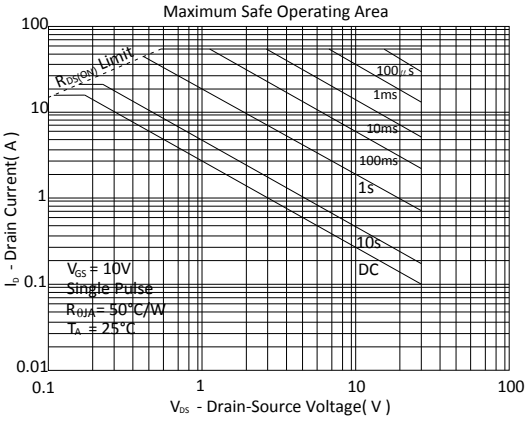

On-Resistance Variation with Gate-Source Voltage
I_D = 7A
T_A = 125°C
T_A = 25°C
$R_{DS(ON)}$,ON-RESISTANCE(OHM)
V_{GS} ,Gate-Source Voltage(V)

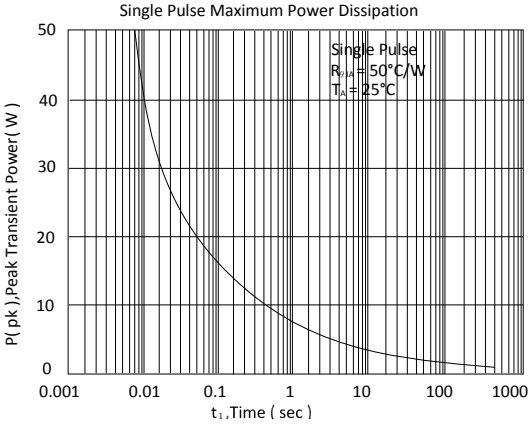

Transfer Characteristics
V_{DS} = 10V
T_A = -55°C
25°C
125°C
I_D - Drain Current(A)
V_{GS} - Gate-Source Voltage(V)

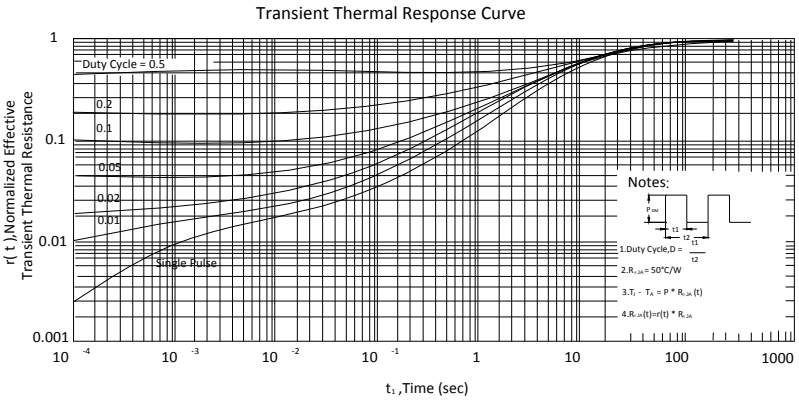

Body Diode Forward Voltage Variation
with Source Current and Temperature
V_{GS} = 0V
T_A = 125° C
25° C
-55° C
Is - Reverse Drain Current(A)
V_{SD} - Body Diode Forward Voltage(V)


Gate Charge Characteristics
I D = 14 A
V DS = 5 V
10 V
15 V
VGS ,Gate-Source Voltage(V)
Qg ,Gate Charge(nC)


Capacitance Characteristics
Ciss
Coss
Crss
f = 1 MHz
VGS = 0 V
C-Capacitance(pF)
VDS -Drain-Source Voltage(V)


Maximum Safe Operating Area
RDS(ON) Limit
100μs
1ms
10ms
100ms
1s
10s
DC
VGS = 10V
Single Pulse
RθJA = 50°C/W
TA = 25°C
ID - Drain Current(A)
VDS - Drain-Source Voltage(V)


Single Pulse Maximum Power Dissipation
Single Pulse
RθJA = 50°C/W
TA = 25°C
P(pk),Peak Transient Power(W)
t1 ,Time (sec)


Transient Thermal Response Curve
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Notes:
1.Duty Cycle,D = t1/t2
2.RθJA = 50°C/W
3.TJ - TA = P * RθJA (t)
4.RθJA(t)=r(t) * RθJA
r(t),Normalized Effective Transient Thermal Resistance
t1 ,Time (sec)