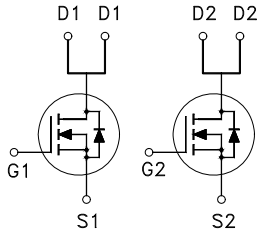
杰力科技股份有限公司
Excelliance MOS Corporation

EMB21A03V

Dual N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	30V
$R_{DSON\ (MAX.)}$	21mΩ
I_D	9A



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

GP GREEN PRODUCT

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_A = 25 °C	I_D	9	A
	T_A = 100 °C		6.3	
Pulsed Drain Current[1]		I_{DM}	36	
Avalanche Current		I_{AS}	10	
Avalanche Energy	L = 0.1mH, I_{AS}=10A, RG=25Ω	E_{AS}	5	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	2.5	
Power Dissipation	T_A = 25 °C	P_D	2.27	W
	T_A = 100 °C		0.9	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

100% UIS testing in condition of V_D=15V, L=0.1mH, V_G=10V, I_L=7.5A, Rated V_{DS}=30V N-CH

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		7.5	°C / W
Junction-to-Ambient[3]	$R_{\theta JA}$		55	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

[3]55°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	9			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 9A		17	21	mΩ
		V_{GS} = 4.5V, I_D = 5A		24	32	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 9A		16		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		520		pF
Output Capacitance	C_{oss}			88		
Reverse Transfer Capacitance	C_{rss}			62		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		2.0		Ω
Total Gate Charge[1,2]	Q_g(V_{GS}=10V)	V_{DS} = 15V, V_{GS} = 10V, I_D = 9A		11.5		nC
	Q_g(V_{GS}=4.5V)			5		
Gate-Source Charge[1,2]	Q_{gs}			1.6		
Gate-Drain Charge[1,2]	Q_{gd}			2.8		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 15V, I_D = 1A, V_{GS} = 10V, R_{GS} = 6Ω		9		nS
Rise Time[1,2]	t_r			12		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			30		
Fall Time[1,2]	t_f			15		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				2.3	A
Pulsed Current[3]	I_{SM}				9.2	
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		50		nS
Peak Reverse Recovery Current	$I_{RM(REC)}$			30		A
Reverse Recovery Charge	Q_{rr}			2		nC

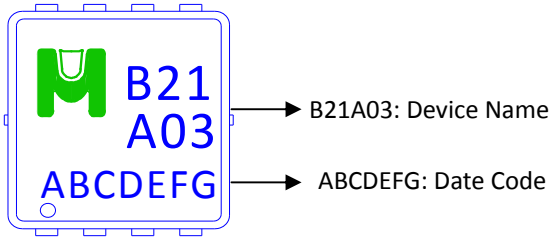
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

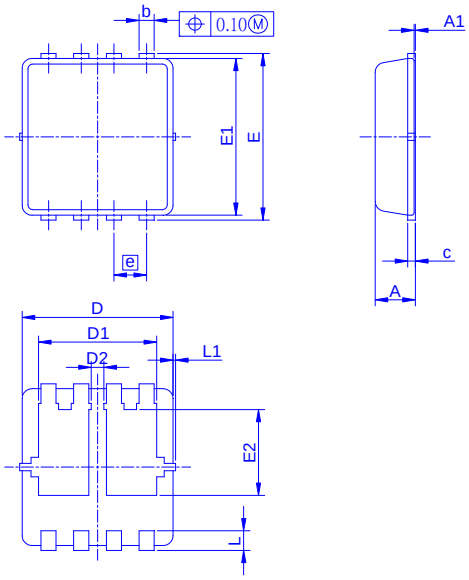
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB21A03V for EDFN 3 x 3



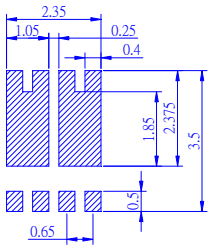
Outline Drawing



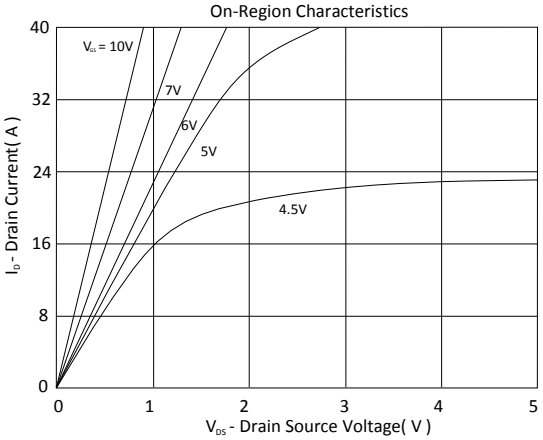
Dimension in mm

Dimension	A	A1	b	c	D	D1	D2	E	E1	E2	e	L	L1	Θ1
Min.	0.65	0	0.20	0.10	2.90	2.15	0.28	3.10	2.90	1.53	0.55	0.30	-	0°
Typ.	0.75	-	0.30	0.15	3.00	2.47	0.38	3.20	3.00	1.81	0.65	0.40	0.075	10°
Max.	0.90	0.05	0.40	0.25	3.30	2.75	-	3.50	3.30	1.98	0.75	0.50	0.150	14°

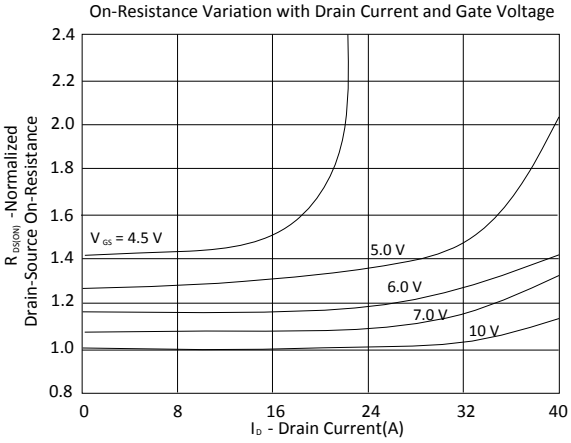
Recommended minimum pads



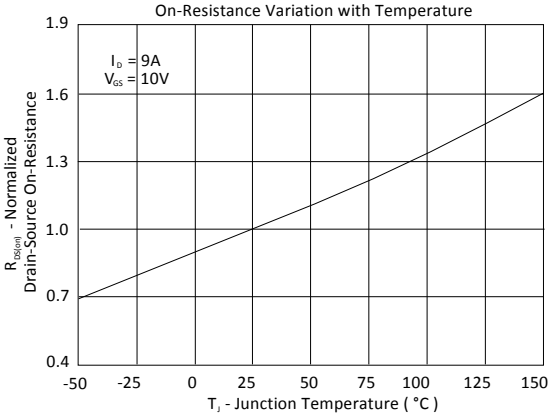
On-Region Characteristics



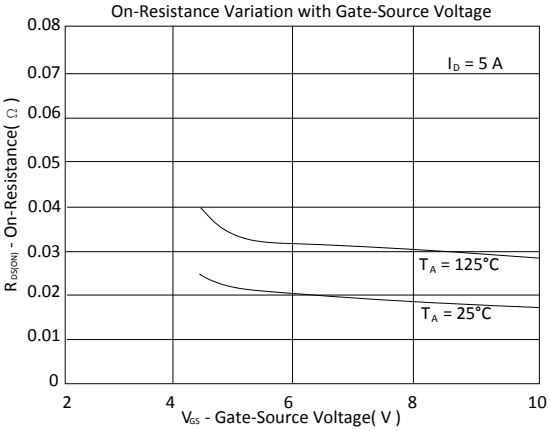
On-Resistance Variation with Drain Current and Gate Voltage



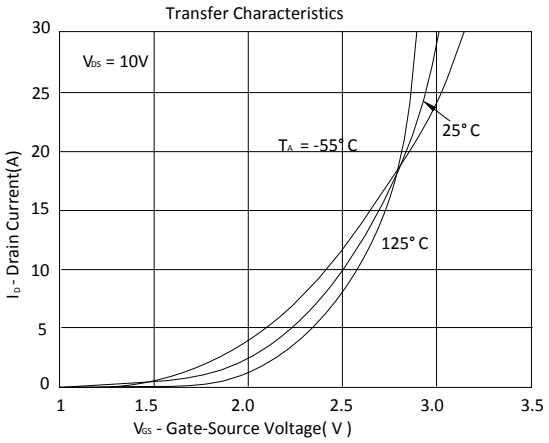
On-Resistance Variation with Temperature



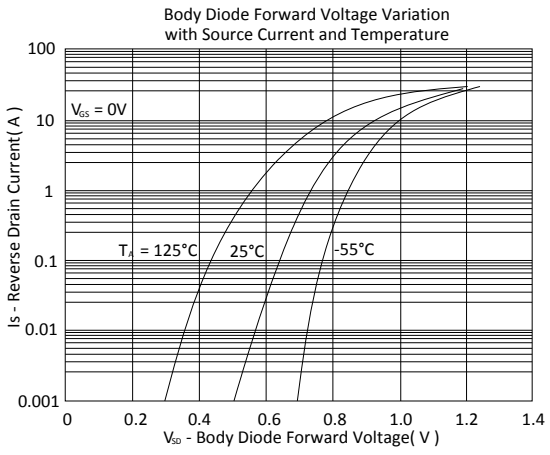
On-Resistance Variation with Gate-Source Voltage



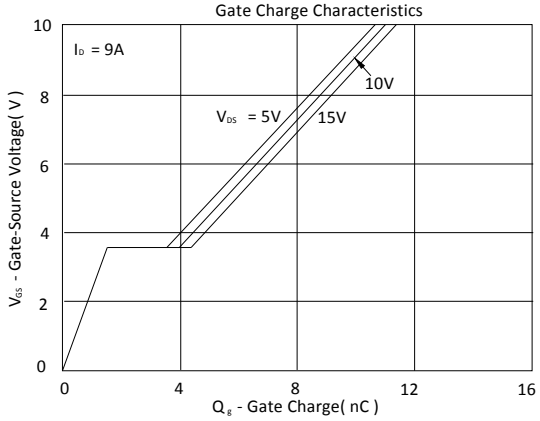
Transfer Characteristics



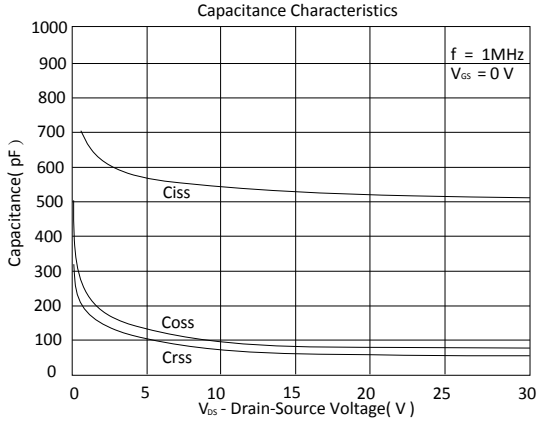
Body Diode Forward Voltage Variation with Source Current and Temperature



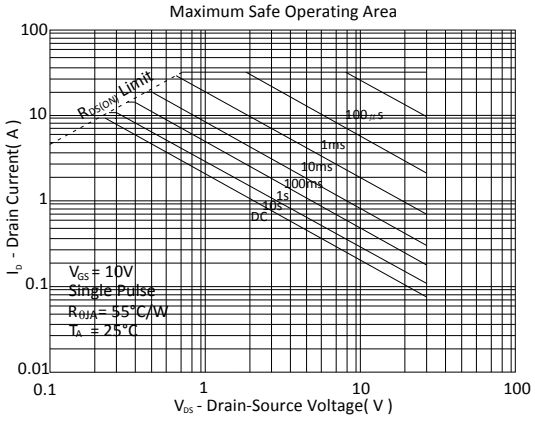
Gate Charge Characteristics



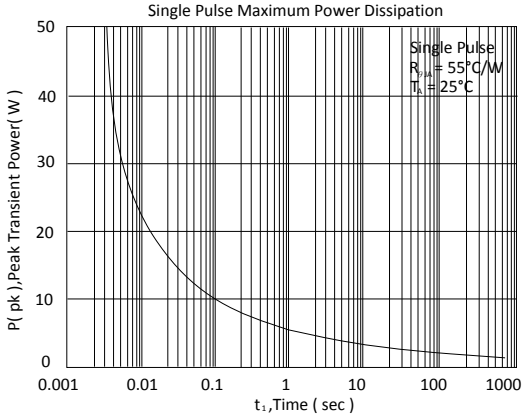
Capacitance Characteristics



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve