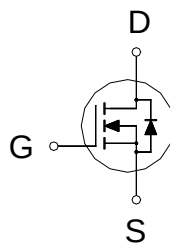


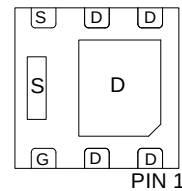
N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	30V
$R_{DS(on)} (MAX.)$	20m Ω
I_D	7A



Bottom View



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A = 25^\circ\text{C}$	I_D	7	A
	$T_A = 100^\circ\text{C}$		4.6	
Pulsed Drain Current ¹		I_{DM}	28	
Avalanche Current		I_{AS}	10	mJ
Avalanche Energy	$L = 0.1\text{mH}, I_D = 10\text{A}, R_G = 25\Omega$	E_{AS}	5	
Repetitive Avalanche Energy ²	$L = 0.05\text{mH}$	E_{AR}	2.5	
Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	2.08	W
	$T_A = 100^\circ\text{C}$		0.83	
Operating Junction & Storage Temperature Range		T_{j}, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		12	$^\circ\text{C} / \text{W}$
Junction-to-Ambient ³	$R_{\theta JA}$		60	

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

³60 $^\circ\text{C} / \text{W}$ when mounted on a 1 in² pad of 2 oz copper.



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT	
			MIN	TYP	MAX		
STATIC							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	3		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24V, V_{GS} = 0V$			1	μA	
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 125\text{ }^{\circ}C$			25		
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 10V, V_{GS} = 10V$	7			A	
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 7A$		15.5	20	m Ω	
		$V_{GS} = 4.5V, I_D = 3A$		25	30		
Forward Transconductance ¹	g_{fs}	$V_{DS} = 5V, I_D = 7A$		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}	$Q_g(V_{GS}=10V)$	$V_{DS} = 15V, V_{GS} = 10V,$ $I_D = 7A$		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}	$t_{d(on)}$	$V_{DS} = 15V,$ $I_D = 1A, V_{GS} = 10V, R_{GS} = 6\Omega$		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 ($T_c = 25\text{ }^{\circ}C$)							
Continuous Current	I_S				7	A	
Pulsed Current ³	I_{SM}				28		
Forward Voltage ¹	V_{SD}	$I_F = I_S, V_{GS} = 0V$			1.2	V	
Reverse Recovery Time	t_{rr}	$I_F = I_S, dI_F/dt = 100A / \mu S$		18		nS	
Reverse Recovery Charge	Q_{rr}			10		nC	

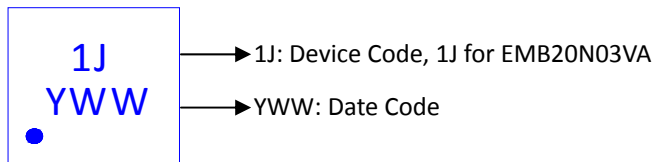
¹Pulse test : Pulse Width $\leq 300\text{ }\mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

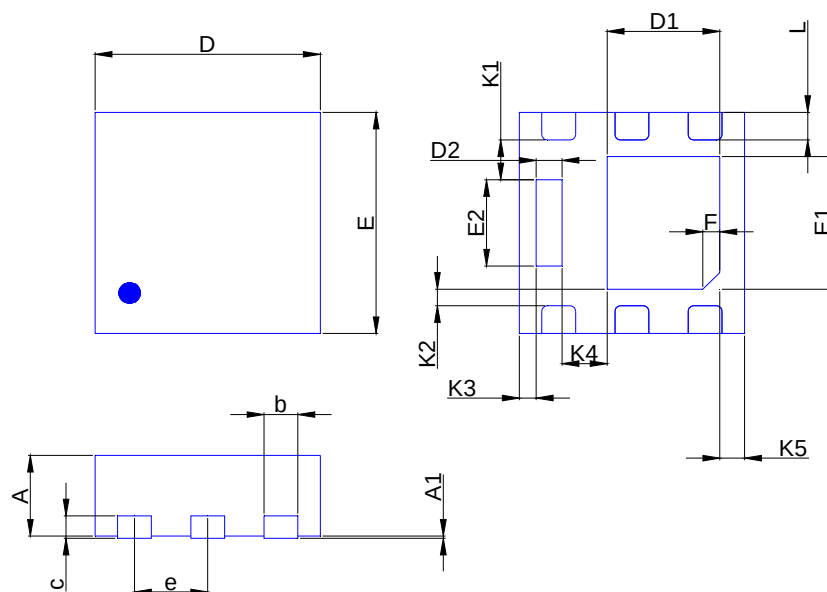
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB20N03VA for EDFN 2 x 2



Outline Drawing



Dimension in mm

Dimension	A	A1	b	c	D	D1	D2	E	E1	E2	e	F	f	K1	K2	L	K3	K4	K5
Min.	0.70	0.00	0.25		1.9	0.9	0.13	1.9	1.1	0.68				0.306	0.10	0.2	0.10	0.35	0.17
Typ.	0.75	0.02	0.30	0.203	2.0	1.0	0.23	2.0	1.2	0.78	0.65	0.15	45°	0.356	0.15	0.25	0.15	0.40	0.22
Max.	0.80	0.05	0.35		2.1	1.1	0.33	2.1	1.3	0.88				0.406	0.20	0.3	0.20	0.45	0.27

Recommended minimum pads

