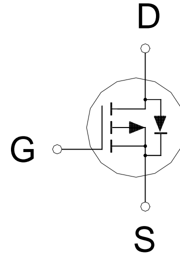
杰力科技股份有限公司
Excelliance MOS Corporation

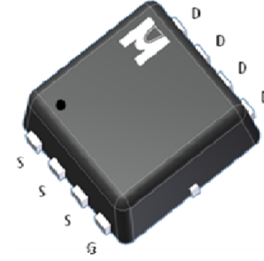
EMB39P04V

P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	-40V
R_{DSON} (MAX.)	39mΩ
I_D	-12A





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_A = 25 °C	I_D	-12	A
	T_A = 100 °C		-8	
Pulsed Drain Current[1]		I_{DM}	-48	
Avalanche Current		I_{AS}	-10	
Avalanche Energy	L = 0.1mH, I_D=-10A, R_G=25Ω	E_{AS}	5	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	2.5	
Power Dissipation	T_A = 25 °C	P_D	2.5	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 in² 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	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-2.0	-2.3	-3.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -32V, V_{GS} = 0V			-1	μA
		V_{DS} = -30V, V_{GS} = 0V, T_J = 125 °C			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-12			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -8A		34	39	mΩ
		V_{GS} = -7V, I_D = -6A		50	70	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -8A		11		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -20V, f = 1MHz		1076		pF
Output Capacitance	C_{oss}			125		
Reverse Transfer Capacitance	C_{rss}			96		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		5.8		Ω
Total Gate Charge[1,2]	Q_g	V_{DS} = -10V, V_{GS} = -10V, I_D = -8A		16.5		nC
Gate-Source Charge[1,2]	Q_{gs}			3.2		
Gate-Drain Charge[1,2]	Q_{gd}			3.8		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = -15V, I_D = -1A, V_{GS} = -10V, R_{GS} = 2.7Ω		7		nS
Rise Time[1,2]	t_r			10		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			20		
Fall Time[1,2]	t_f			12		
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 A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F = I_S, dI_F/dt = 100A / μS		15		nS
Reverse Recovery Charge	Q_{rr}			8		nC

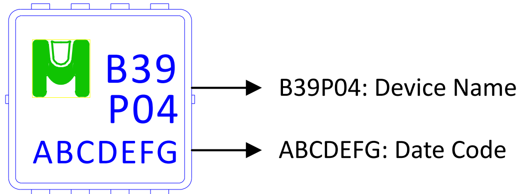
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

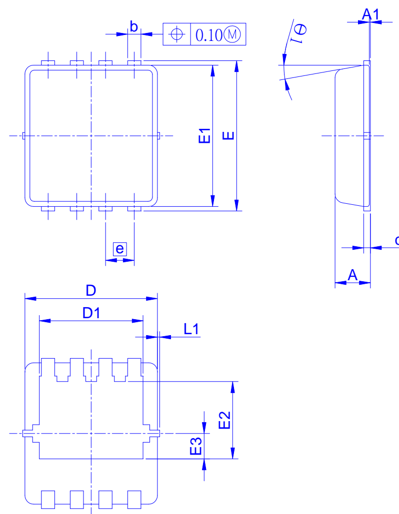
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB39P04V for EDFN 3 x 3



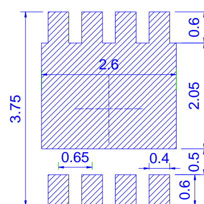
Outline Drawing



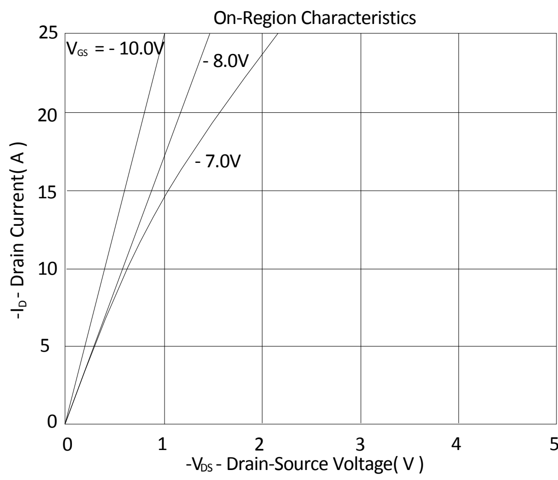
Dimension in mm

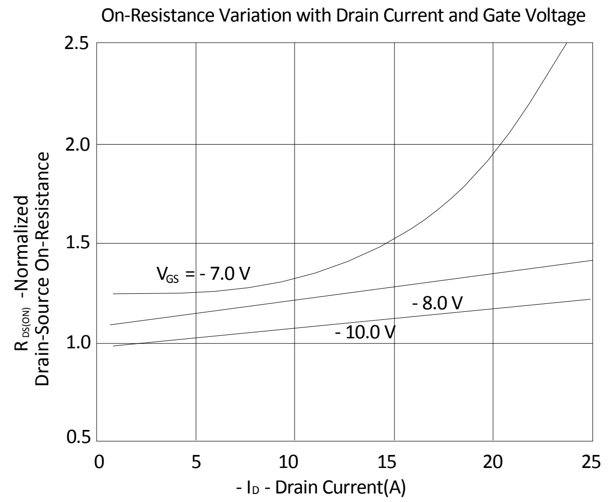
Dimension	A	A1	b	c	D	D1	E	E1	E2	E3	e	L	L1	Θ1
Min.	0.70	0	0.24	0.10	2.95	2.25	3.15	2.95	1.65			0.30		0°
Typ.	0.80		0.30	0.152	3.00	2.35	3.20	3.00	1.75	0.575	0.65	0.40	0.13	10°
Max.	0.90	0.05	0.37	0.25	3.15	2.45	3.40	3.15	1.96			0.50		12°

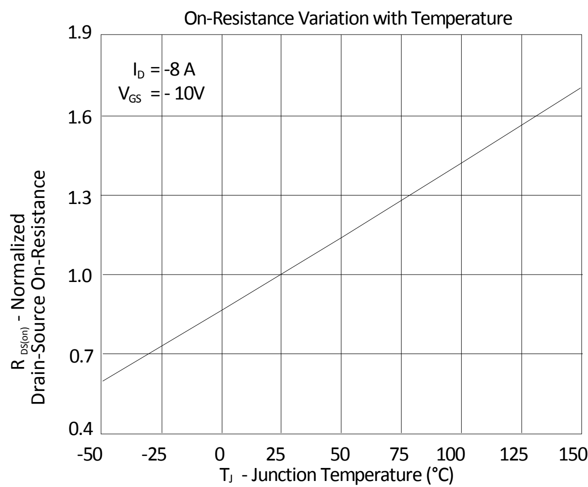
Recommended minimum pads

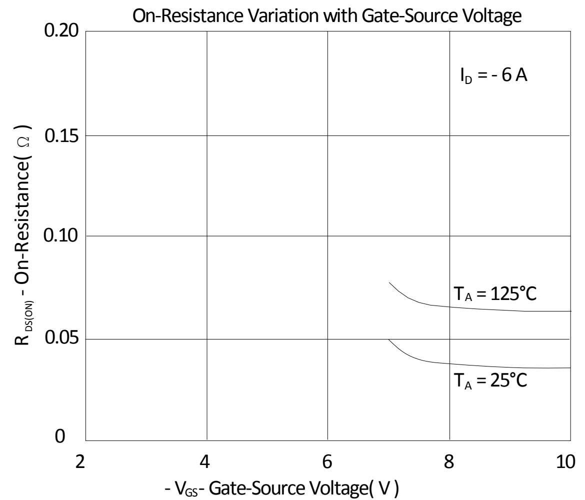


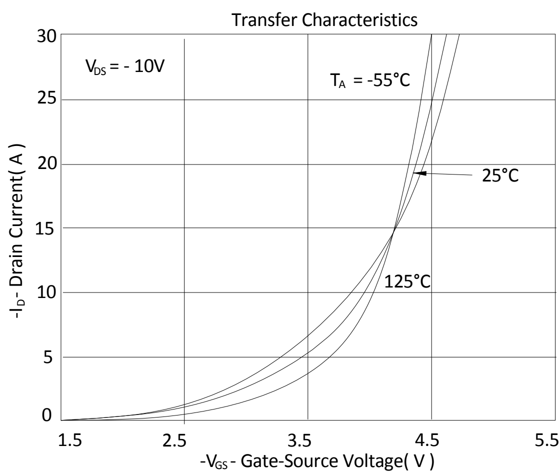
TYPICAL CHARACTERISTICS

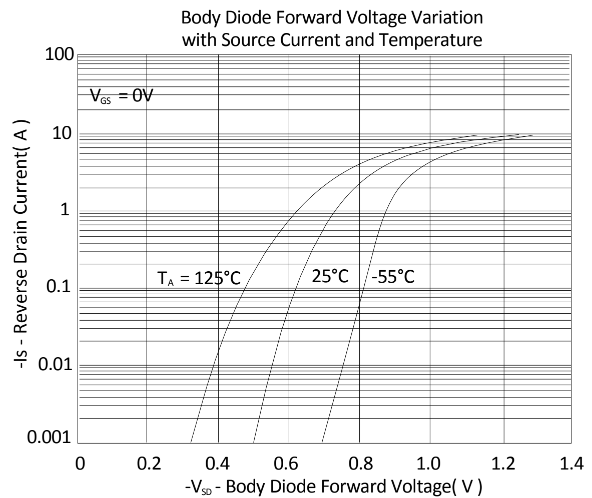


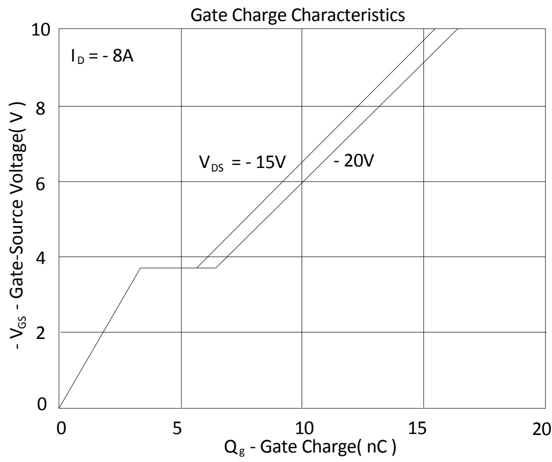


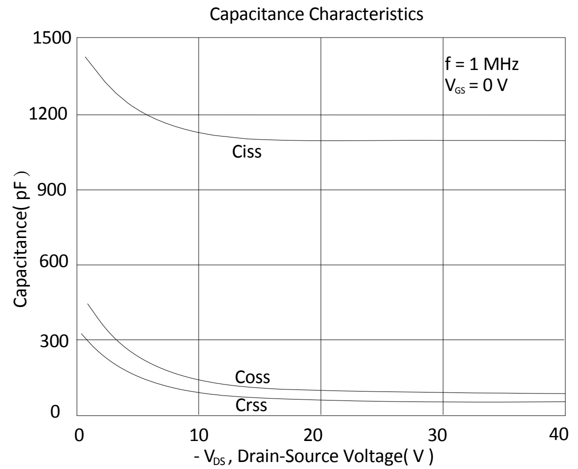


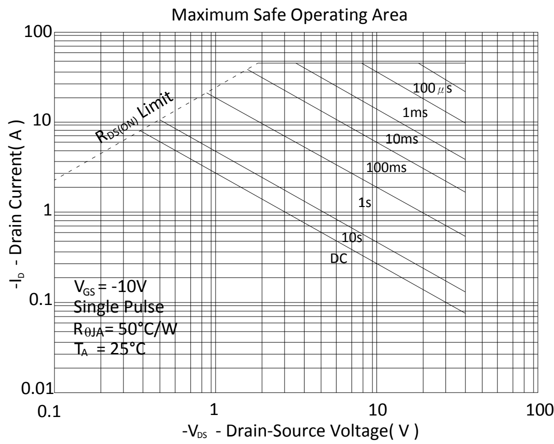


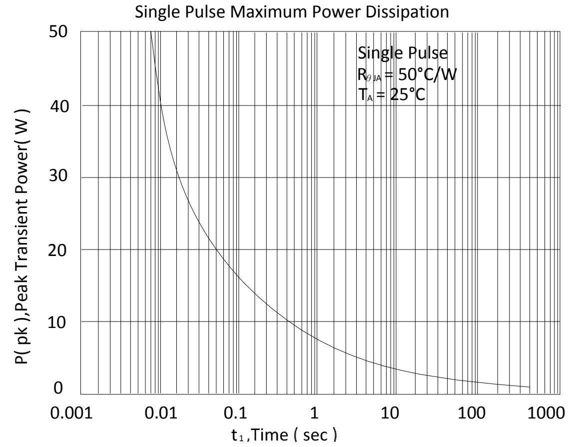


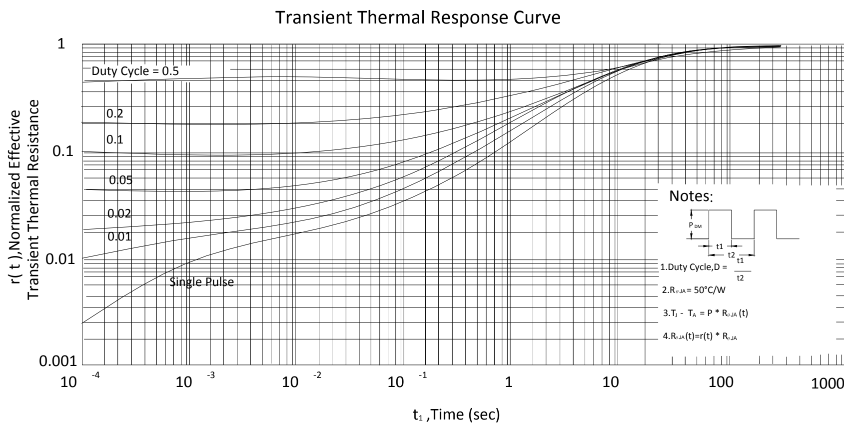



Gate Charge Characteristics
I_D = - 8A
V_{DS} = - 15V
- 20V
- V_{GS} - Gate-Source Voltage(V)
Q_g - Gate Charge(nC)


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


Maximum Safe Operating Area
RDS(ON) Limit
100μs
1ms
10ms
100ms
1s
10s
DC
V_{GS} = -10V
Single Pulse
RθJA= 50°C/W
T_A = 25°C
-I_D - Drain Current(A)
-V_{DS} - Drain-Source Voltage(V)


Single Pulse Maximum Power Dissipation
Single Pulse
RθJA = 50°C/W
T_A = 25°C
P(pk),Peak Transient Power(W)
t_1 ,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
t_1 ,Time (sec)