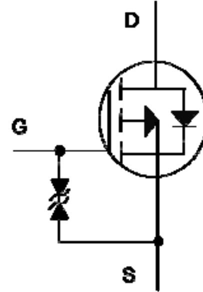
杰力科技股份有限公司
Excelliance MOS Corporation

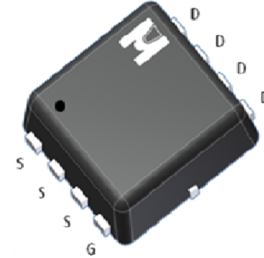
EMZB08P03V

P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	-30V
$R_{DSON (MAX.)}$	8.5mΩ
I_D	-25A





UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

ESD Protection

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	-20	A
	T_C = 100 °C		-18	
Pulsed Drain Current[1]		I_{DM}	-100	
Avalanche Current		I_{AS}	-25	
Avalanche Energy	L = 0.1mH, I_D=-25A, R_G=25Ω	E_{AS}	31.25	mJ
Power Dissipation	T_C = 25 °C	P_D	2.5	W
	T_C = 100 °C		1	
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=-20A, Rated V_{DS}=-30V P-CH

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 MIN	LIMITS TYP	LIMITS MAX	UNIT
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} = ±12V			±10	μA
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			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-25			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -12A		7	8.5	mΩ
		V_{GS} = -4.5V, I_D = -9A		12	15	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -12A		26		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz		3091		pF
Output Capacitance	C_{oss}			476		
Reverse Transfer Capacitance	C_{rss}			404		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		3.5		Ω
Total Gate Charge[1,2]	$Q_g(V_{GS}=10V)$	V_{DS} = -15V, V_{GS} = -10V, I_D = -12A		54		nC
	$Q_g(V_{GS}=4.5V)$			32		
Gate-Source Charge[1,2]	Q_{gs}			7.3		
Gate-Drain Charge[1,2]	Q_{gd}			13		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = -15V, I_D = -1A, V_{GS} = -10V, R_{GS} = 2.7Ω		24		nS
Rise Time[1,2]	t_r			20		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			70		
Fall Time[1,2]	t_f			12		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				-25	A
Pulsed Current[3]	I_{SM}				-100	
Forward Voltage[1]	V_{SD}	I_F = -12A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F = I_S, dI_F/dt = 100A / μS		52		nS
Reverse Recovery Charge	Q_{rr}			60		nC

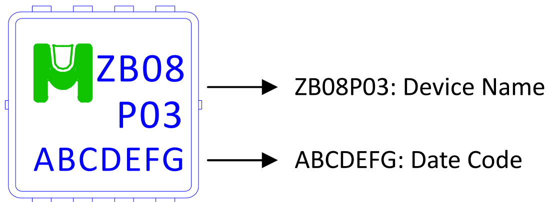
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

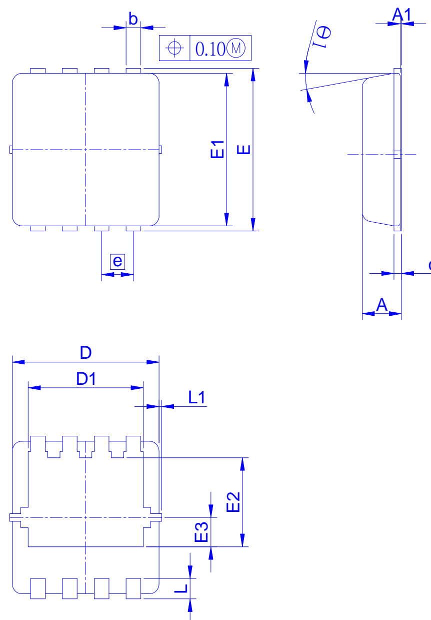
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMZB08P03V for EDFN 3 x 3



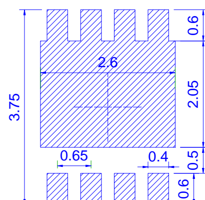
Outline Drawing

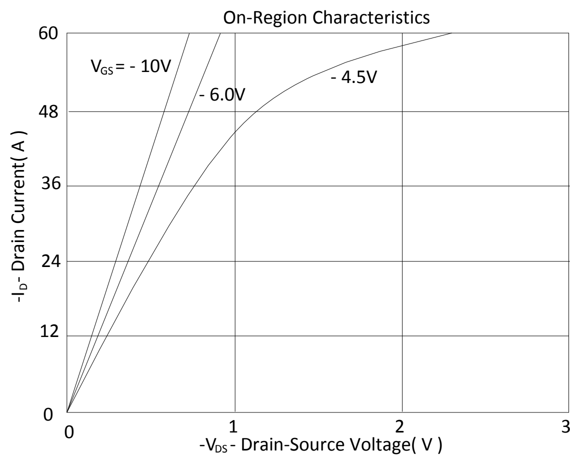


Dimension in mm

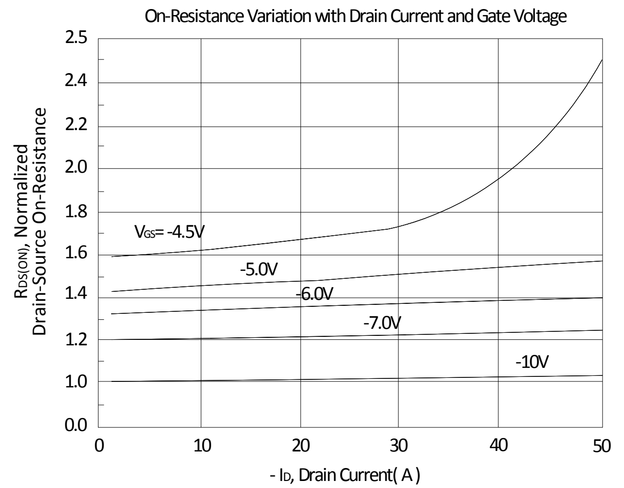
Dimension	A	A1	b	c	D	D1	E	E1	E2	E3	e	L	L1	Θ1
Min.	0.70	0	0.24	0.10	2.95	2.25	3.15	2.95	1.65			0.30		0°
Typ.	0.80		0.30	0.152	3.00	2.35	3.20	3.00	1.75	0.575	0.65	0.40	0.13	10°
Max.	0.90	0.05	0.37	0.25	3.15	2.45	3.40	3.15	1.96			0.50		12°

Recommended minimum pads

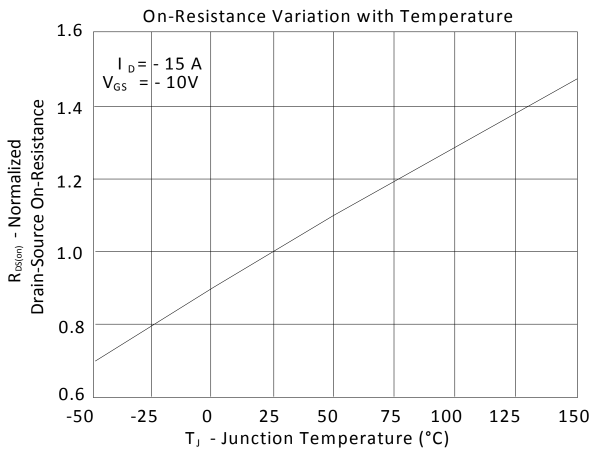




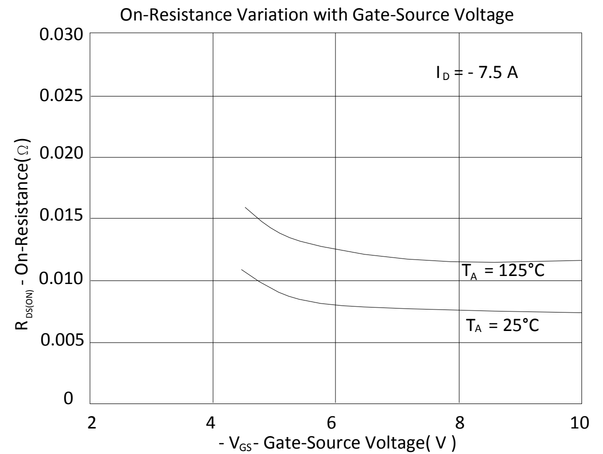
On-Region Characteristics
60
48
36
24
12
0
0
1
2
3
V_{GS} = - 10V
- 6.0V
- 4.5V
$-I_D$ - Drain Current(A)
$-V_{DS}$ - Drain-Source Voltage(V)



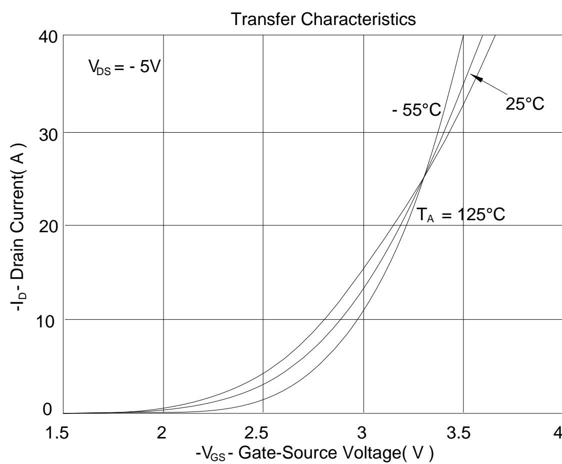
On-Resistance Variation with Drain Current and Gate Voltage
2.5
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.0
0
10
20
30
40
50
V_{GS}= -4.5V
-5.0V
-6.0V
-7.0V
-10V
$R_{DS(ON)}$, Normalized
Drain-Source On-Resistance
- I_D, Drain Current(A)



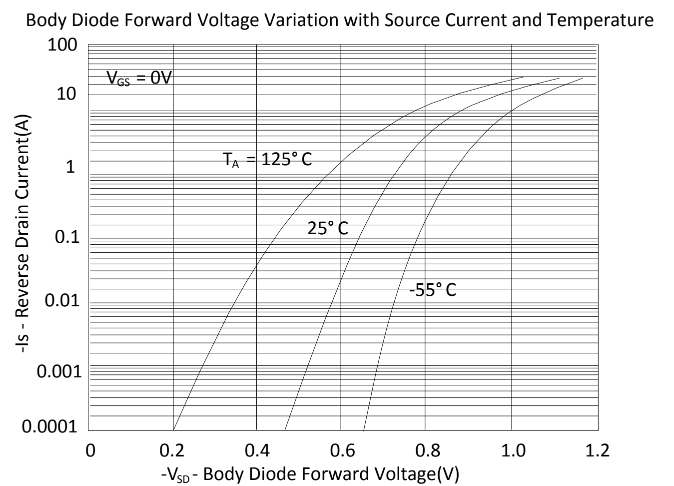
On-Resistance Variation with Temperature
1.6
1.4
1.2
1.0
0.8
0.6
-50
-25
0
25
50
75
100
125
150
I_D = - 15 A
V_{GS} = - 10V
$R_{DS(on)}$ - Normalized
Drain-Source On-Resistance
T_J - Junction Temperature (°C)



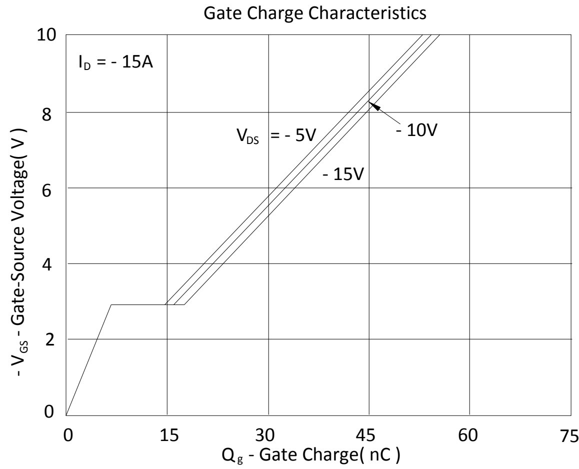
On-Resistance Variation with Gate-Source Voltage
0.030
0.025
0.020
0.015
0.010
0.005
0
2
4
6
8
10
I_D = - 7.5 A
T_A = 125°C
T_A = 25°C
$R_{DS(ON)}$ - On-Resistance(Ω)
- V_{GS} - Gate-Source Voltage(V)



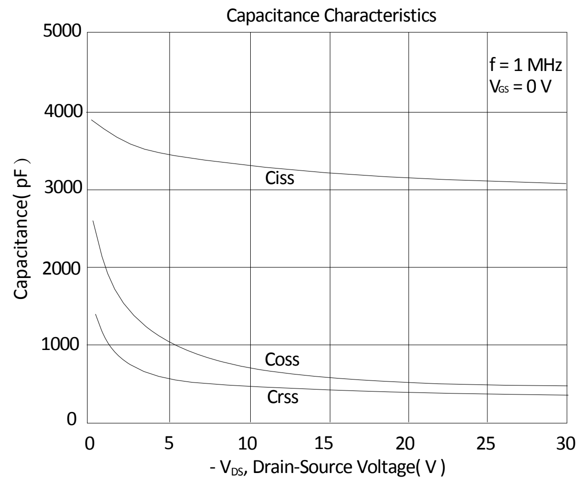
Transfer Characteristics
40
30
20
10
0
1.5
2
2.5
3
3.5
4
V_{DS} = - 5V
- 55°C
25°C
T_A = 125°C
$-I_D$ - Drain Current(A)
$-V_{GS}$ - Gate-Source Voltage(V)



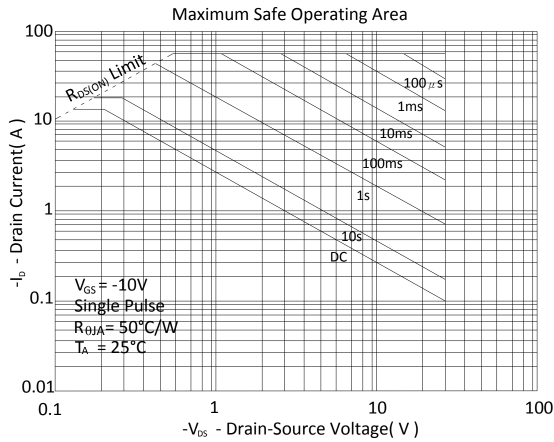
Body Diode Forward Voltage Variation with Source Current and Temperature
100
10
1
0.1
0.01
0.001
0.0001
0
0.2
0.4
0.6
0.8
1.0
1.2
V_{GS} = 0V
T_A = 125° C
25° C
-55° C
-Is - Reverse Drain Current(A)
$-V_{SD}$ - Body Diode Forward Voltage(V)



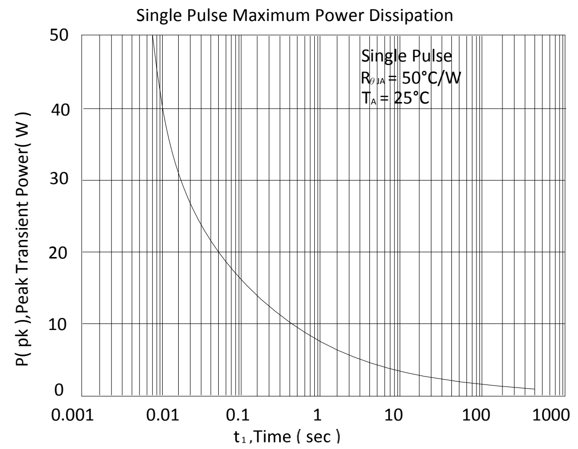
Gate Charge Characteristics
I_D = - 15A
V_DS = - 5V
- 10V
- 15V
- V_GS - Gate-Source Voltage(V)
Q_g - Gate Charge(nC)



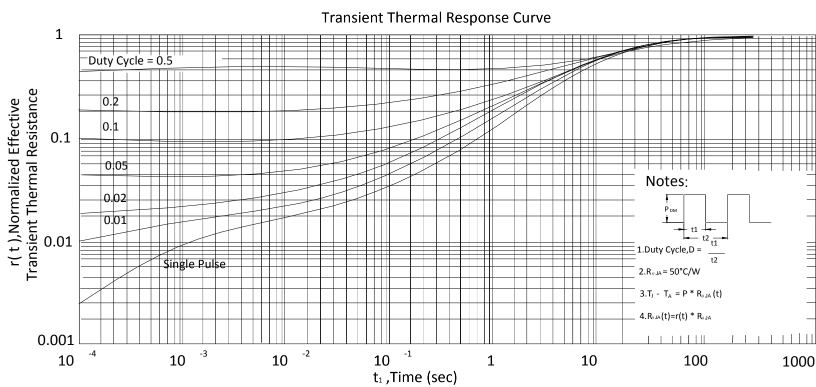
Capacitance Characteristics
f = 1 MHz
V_GS = 0 V
Ciss
Coss
Crss
Capacitance(pF)
- V_DS, Drain-Source Voltage(V)



Maximum Safe Operating Area
R_DS(ON) Limit
100 μs
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)
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.T_J - T_A = P * RθJA (t)
4.RθJA(t)=r(t) * RθJA
r(t),Normalized Effective Transient Thermal Resistance
t₁ ,Time (sec)