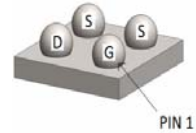
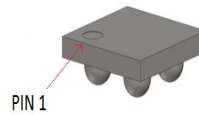
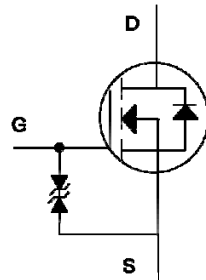


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	30V
$R_{DS(on) (MAX.)}$	60m Ω
I_D	3.2A



Pb-Free Lead Plating & Halogen Free

ESD Protection



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_A = 25\text{ }^\circ\text{C}$	I_D	3.2	A
	$T_A = 70\text{ }^\circ\text{C}$		2.5	
Pulsed Drain Current ¹		I_{DM}	12.8	
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	P_D	1.3	W
	$T_A = 70\text{ }^\circ\text{C}$		0.84	
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-Ambient ³	$R_{\theta JA}$		95	$^\circ\text{C} / \text{W}$

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

³95 $^\circ\text{C} / \text{W}$ when mounted on a 1 in² 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	0.4	0.8	1.2	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±12V			±5	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} = 4.5V	3.2			A
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 1A		50	60	mΩ
		V _{GS} = 2.5V, I _D = 1A		63	80	
		V _{GS} = 1.8V, I _D = 0.5A		82	110	
Forward Transconductance ¹	g _{fs}	V _{DS} = 5V, I _D = 1A		7		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz		515		pF
Output Capacitance	C _{oss}			90		
Reverse Transfer Capacitance	C _{rss}			75		
Total Gate Charge ^{1,2}	Q _g	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 1A		8.5		nC
Gate-Source Charge ^{1,2}	Q _{gs}			1.0		
Gate-Drain Charge ^{1,2}	Q _{gd}			2.7		
Turn-On Delay Time ^{1,2}	t _{d(on)}	V _{DS} = 15V, I _D = 1A, V _{GS} = 4.5V, R _{GEN} = 6Ω		23		nS
Rise Time ^{1,2}	t _r			12		
Turn-Off Delay Time ^{1,2}	t _{d(off)}			35		
Fall Time ^{1,2}	t _f			18		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I _S				3.2	A
Pulsed Current ³	I _{SM}				12.8	
Forward Voltage ¹	V _{SD}	I _F = 1A, V _{GS} = 0V			1.2	V

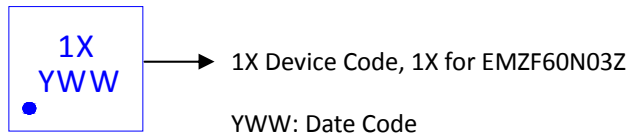
¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

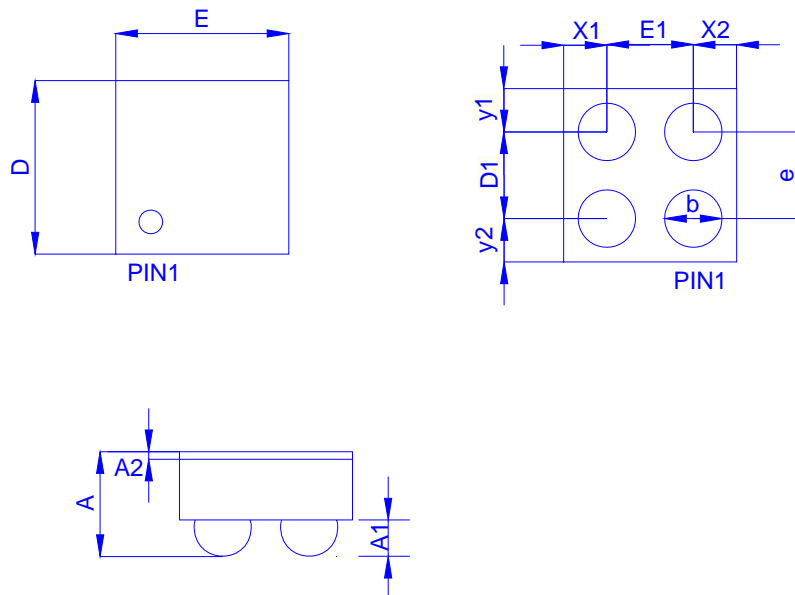
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMZF60N03Z for WLCSP



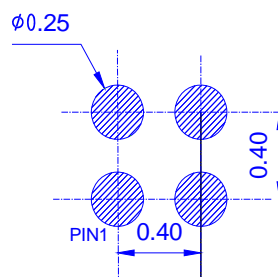
Outline Drawing



Dimension in mm

Dimension	A	A1	A2	D	D1	E	E1	b	e	X1	X2	y1	y2
Min.	0.463	0.168	0.020	0.770	0.400 (BSC)	0.770	0.400 (BSC)	0.265	0.400 (BSC)	0.200 (REF)	0.200 (REF)	0.200 (REF)	0.200 (REF)
Max.	0.503	0.228	0.050	0.830		0.830							

Footprint





TYPICAL CHARACTERISTICS

