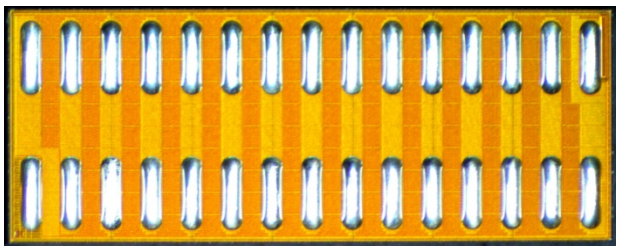
EPC2023 – Enhancement Mode Power Transistor
Preliminary Specification Sheet

Status: Engineering

Features:

- V_{DS}, 30 V
- Maximum $R_{DS(ON)}$, 1.3 mΩ
- I_D, 60 A
- Pb-Free (RoHS Compliant), Halogen Free



EPC2023 eGaN® FETs are supplied only in passivated die form with solder bars

Die Size: 6.05 mm x 2.3 mm

Applications:

- High Frequency DC-DC Conversion
- Motor Drive
- Industrial Automation
- Synchronous Rectification
- Inrush Protection
- Point-of-Load (POL) Converters

MAXIMUM RATINGS

Parameter	Value
V_{DS} (Maximum Drain – Source Voltage)	30 V
V_{GS} (Gate – Source Maximum Voltage Range)	-4 V < V_{GS} < 6 V
I_D Continuous Drain Current, 25 °C, θ_{JA} = 13.5)	60 A
I_D (Maximum Pulsed Drain Current, 25 °C, T_{pulse} = 300 µs)	590 A
T_J (Optimum Temperature Range)	-40 °C < T_J < 150 °C

STATIC CHARACTERISTICS

Parameter	Conditions	Value
I_{DSS} (Maximum Drain – Source Leakage)	V_{DS} = 24 V, V_{GS} = 0 V	1.0 mA
$R_{DS(ON)}$ (Maximum $R_{DS(ON)}$)	V_{GS} = 5 V, I_D = 40 A	1.3 mΩ
$R_{DS(ON)}$ (Typical $R_{DS(ON)}$)	V_{GS} = 5 V, I_D = 40 A	1 mΩ
$V_{GS(TH)}$ (Gate – Source Threshold Voltage)	V_{DS} = V_{GS}, I_D = 20 mA	0.7 V < $V_{GS(TH)}$ < 2.5 V
I_{GSS} (Gate – Source Maximum Positive Leakage)	V_{GS} = 5 V	9 mA
I_{GSS} (Gate – Source Maximum Negative Leakage)	V_{GS} = -4 V	-1 mA

T_J = 25 °C unless otherwise stated

Specifications are with Substrate shorted to Source where applicable

DYNAMIC CHARACTERISTICS

Parameter	Conditions	Typical Value
C_{ISS} (Input Capacitance)	V_{DS} = 15 V, V_{GS} = 0 V	2.3 nF
C_{OSS} (Output Capacitance)		1.3 nF
C_{RSS} (Reverse Transfer Capacitance)		56 pF
R_G (Gate Resistance)		0.3 Ω
Q_G (Total Gate Charge)	V_{DS} = 15 V, I_D = 40 A	20 nC
Q_{GS} (Gate to Source Charge)		5.8 nC
Q_{GD} (Gate to Drain Charge)		1.9 nC
$Q_{G(TH)}$ (Gate Charge at Threshold)		3.6 nC
Q_{OSS} (Output Charge)	V_{DS} = 15 V, V_{GS} = 0 V	28 nC
Q_{RR} (Source-Drain Recovery Charge)		0

T_J = 25 °C unless otherwise stated
Specifications are with Substrate shorted to Source where applicable

THERMAL CHARACTERISTICS

		TYP	
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.5	°C/W
$R_{\theta JB}$	Thermal Resistance, Junction to Board	1.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1)	42	°C/W

Note 1: $R_{\theta JA}$ is determined with the device mounted on one square inch of copper pad, single layer 2 oz copper on FR4 board.

Figure 1:

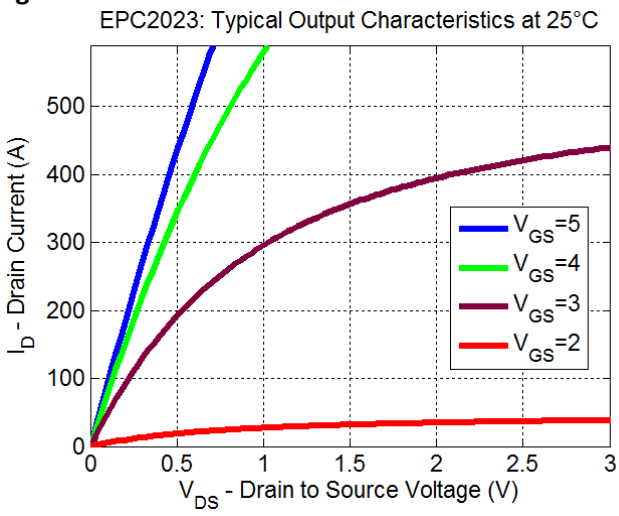


Figure 2:

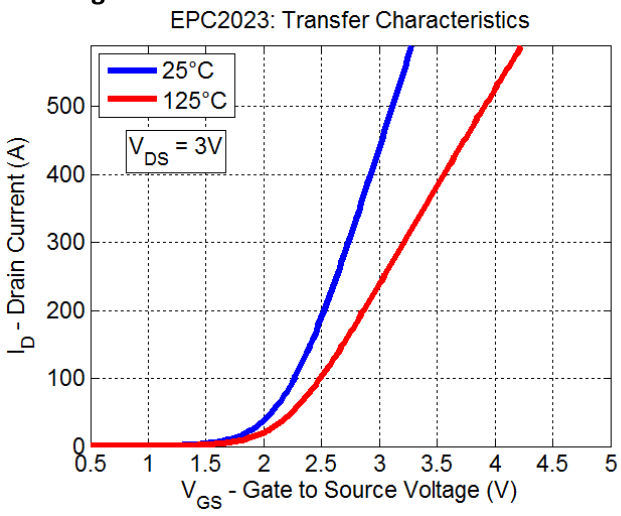


Figure 3:

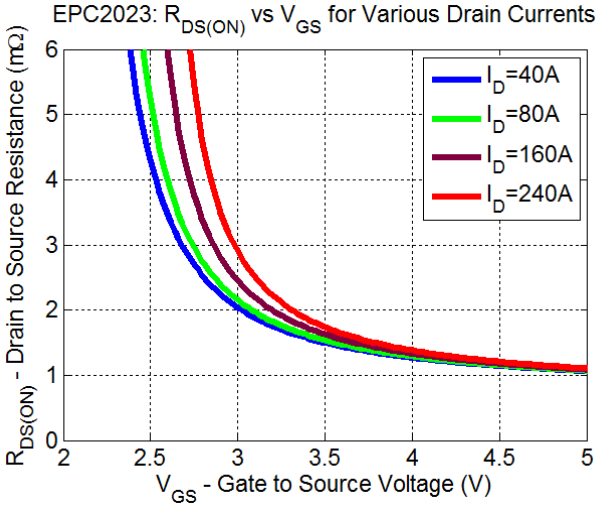


Figure 4:

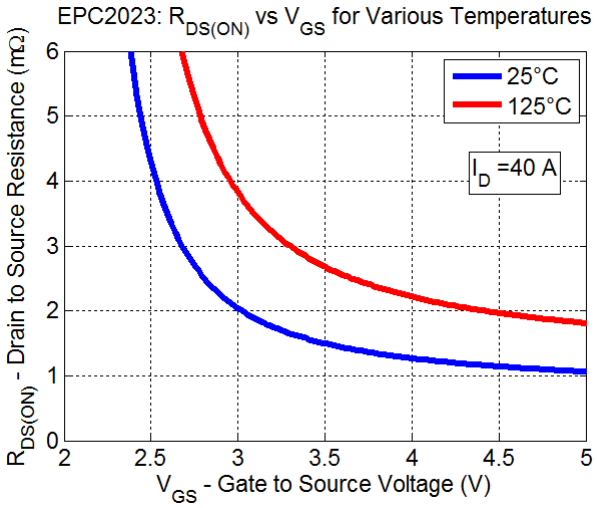


Figure 5a:

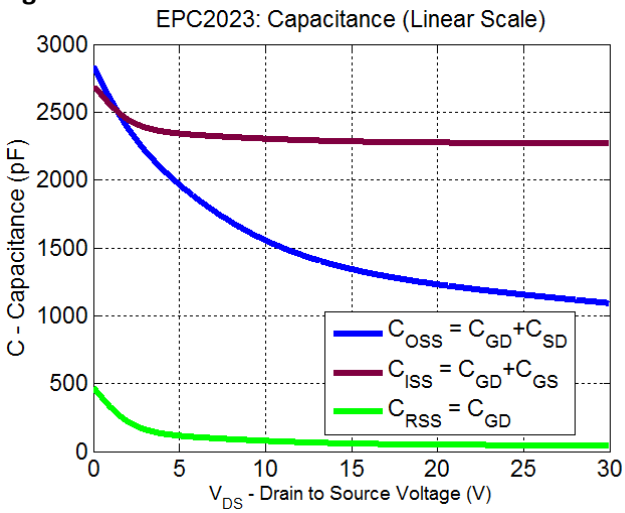


Figure 5b:

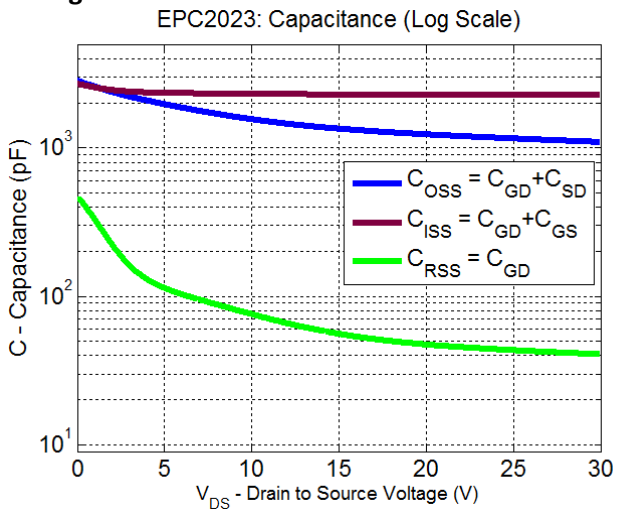


Figure 6:

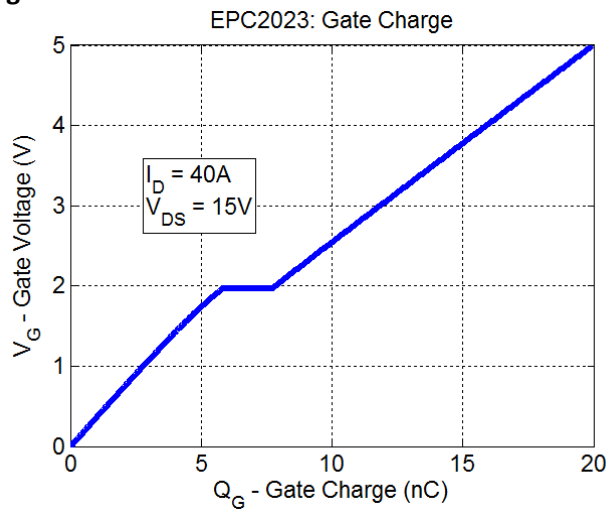


Figure 7:

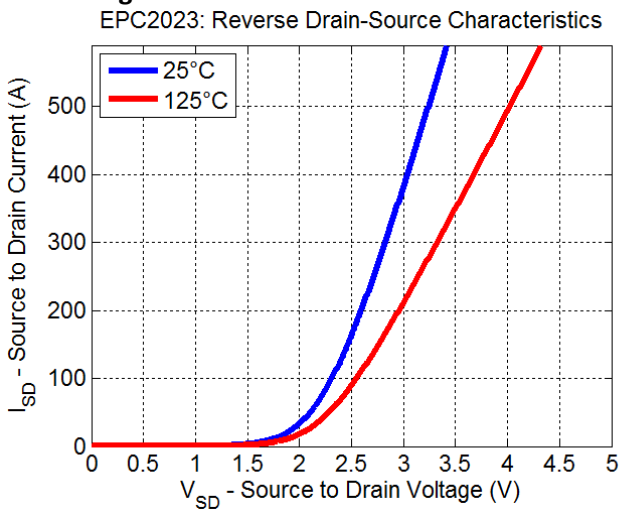


Figure 8:

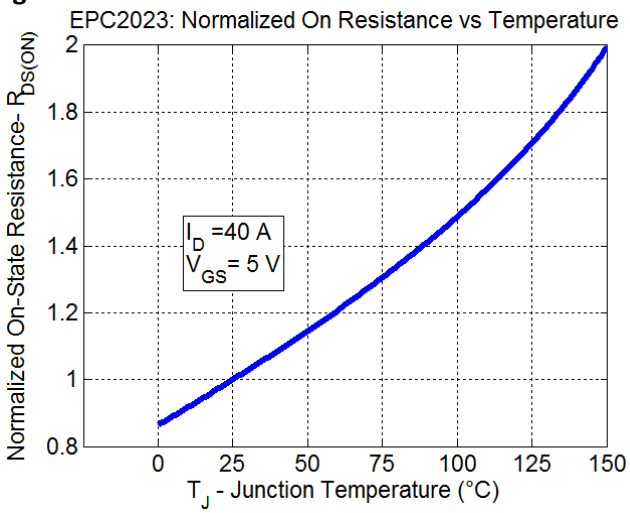
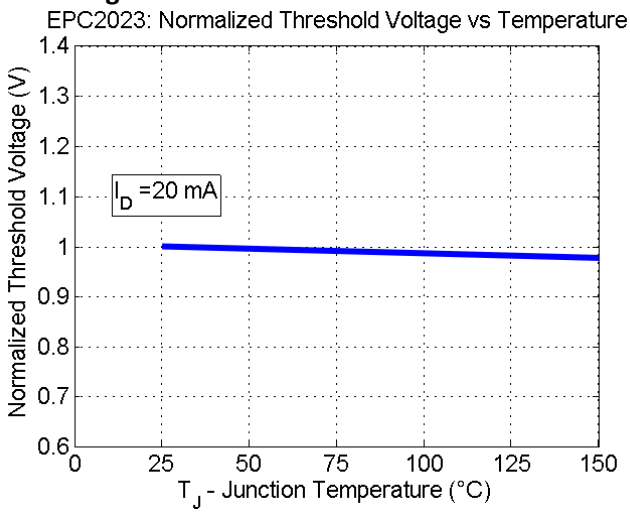
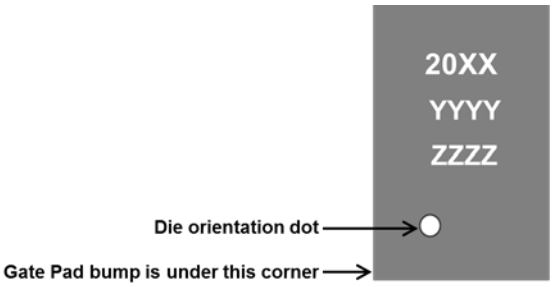


Figure 9:



All measurements were done with substrate shorted to source

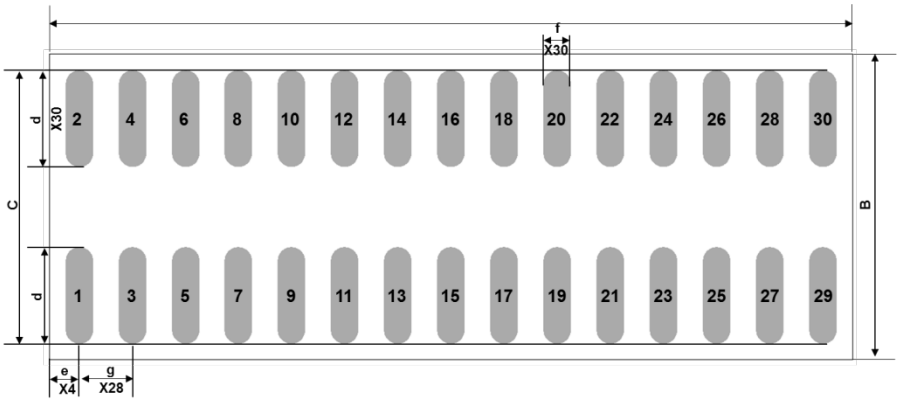
DIE MARKINGS



Part Number	Laser Marking		
	Part # Marking Line 1	Lot_Date Code Marking Line 2	Lot_Date Code Marking Line 3
EPC2023ENGR	20XX	YYYY	ZZZZ

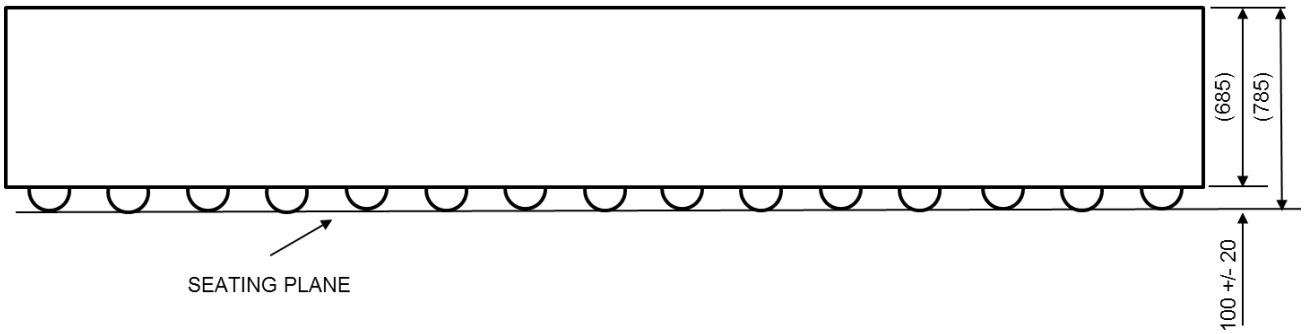
DIE OUTLINE

Solder Bar View



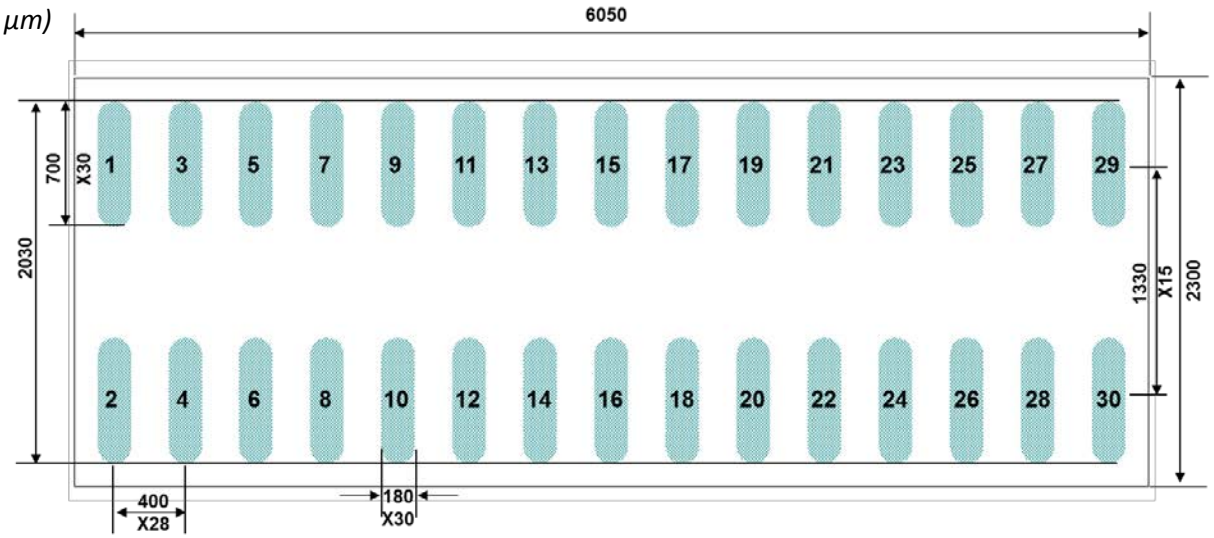
DIM	MICROMETERS		
	MIN	Nominal	MAX
A	6020	6050	6080
B	2270	2300	2330
c	2047	2050	2053
d	717	720	723
e	210	225	240
f	195	200	205
g	400	400	400

Side View



RECOMMENDED LAND PATTERN

(*Units in µm)*

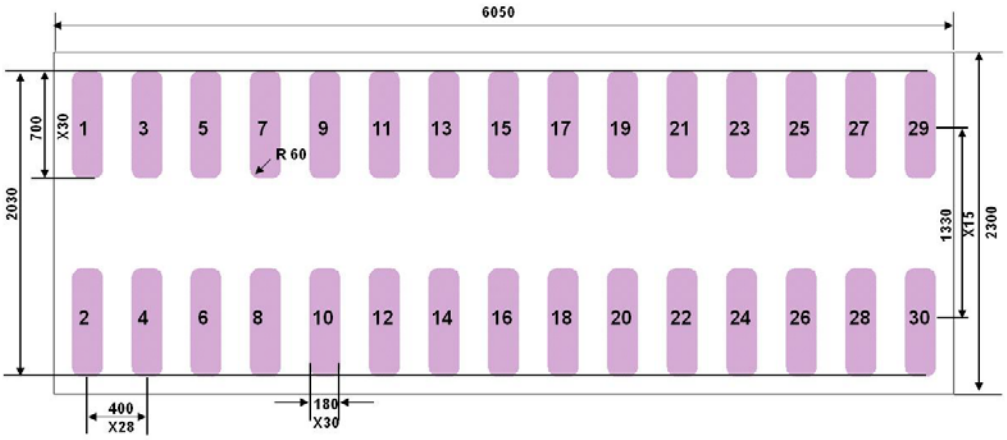


Pad 1 is Gate
Pads 2,5,6,9,10,13,14,17,18,21,22,25,26,29 are Source
Pads 3,4,7,8,11,12,15,16,19,20,23,24,27,28 are Drain
Pad 30 is Substrate

Land pattern is solder mask defined
Solder mask opening is 10 µm smaller per side than bump

RECOMMENDED STENCIL

(*Units in µm)*



Pad 1 is Gate

Pads 2,5,6,9,10,13,14,17,18, 21,22,25,26,29 are Source

Pads 3,4,7,8,11,12,15,16,19, 20,23,24,27,28 are Drain

Pad 30 is Substrate

Recommended stencil should be 4mil (100µm) thick, must be laser cut, openings per drawing.