EPC·SPACE

EPC7030M – Rad Hard Power GaN Transistor Target Datasheet

Summary:

Rad Hard e-GaN® 300 V, 50 A, 35 mΩ max Surface Mount (FSMD-M)

Absolute Maximum Rating (T_J= 25˚C unless otherwise noted)			
Symbol	**Parameter-Conditions**	**Value**	**Units**
V_{DS}	Drain-to-Source Voltage (Note 1)	300	V
	Drain-to-Source Voltage (up to 10,000 5ms pulses at 150˚C)	360	
I_D	Continuous Drain Current at V_{GS} = 5 V	50	A
I_{DM}	Pulsed (25˚C, T_{PULSE} = 300 µs)	200	
V_{GS}	Gate-to-Source Voltage (Note 2)	+6 / -4	V
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	˚C
T_{SOL}	Package Mounting Surface Temperature	260	
ESD	ESD Class	1A -2A	

Static Characteristics (T_J= 25˚C unless otherwise noted)						
PARAMETER		**TEST CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
BV_{DSS}	Drain-to-Source Voltage	V_{GS} = 0 V, I_D = 1.0 mA	300			V
I_{DSS}	Drain Source Leakage	V_{DS} = 300 V, V_{GS} = 0 V		10	500	µA
		V_{DS} = 300 V, V_{GS} = 0 V, T_J =125C		25	1000	
I_{GSS}	Gate-to-Source Forward Leakage	V_{GS} = 6 V		0.5	1.6	mA
	Gate-to-Source Forward Leakage#	V_{GS} = 6 V, T_J = 125°C		1	3.0	
	Gate-to-Source Reverse Leakage	V_{GS} = -4 V			0.500	
$V_{GS(TH)}$	Gate-to-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 18 mA	0.8	1.4	2.5	V
$\Delta V_{GS(TH)}$	Gate-to-Source Threshold Voltage Temperature Coefficient			|2.0|		mV/˚C
$R_{DS(on)}$	Drain-Source On Resistance (Note 4)	V_{GS} = 5 V, I_D = 50 A		28	32	mΩ
V_{SD}	Source-Drain Forward Voltage (Note 5)	I_S = 0.5 A, V_{GS} = 0 V		2.0		V

All measurements were done with substrate shorted to source.

Defined by design. Not subject to production test.

Dynamic Characteristics (T_J= 25˚C, f = 1 MHz unless otherwise noted)						
PARAMETER		**TEST CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
C_{ISS}	Input Capacitance	V_{DS} = 150 V, V_{GS} = 0 V		1155		pF
C_{RSS}	Reverse Transfer Capacitance			10		
C_{OSS}	Output Capacitance			235		
Q_G	Total Gate Charge	V_{DS} = 150 V, V_{GS} = 5 V, I_D= 50 A		15		nC
Q_{GS}	Gate-to-Source Charge			4		
Q_{GD}	Gate-to-Drain Charge			4		
Q_{RR}	Source-Drain Recovery Charge			0		

All measurements were done with substrate shorted to source.

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RADIATION CHARACTERISTICS

EPC Space eGaN® HEMTs are tested according to MIL-STD-750 Method 1019 for total ionizing dose validation. Every manufacturing lot is tested for total ionizing dose of 1 Mrad of Gamma radiation exposure with an in-situ bias for the following conditions:

ON | VGS = 5 V

NO BIAS | VDS = VGS = 0 V

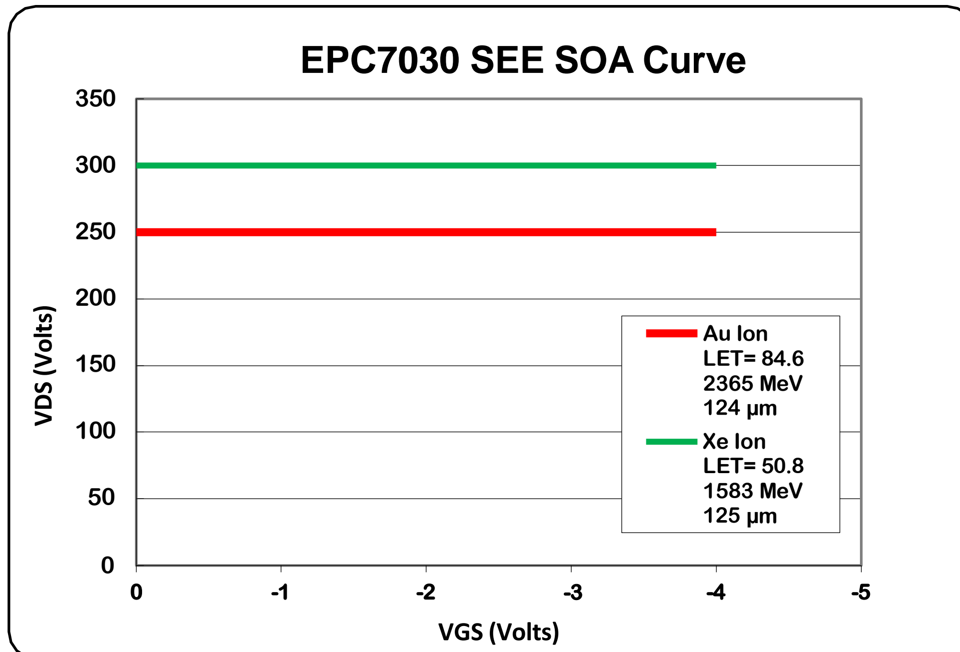
OFF | VDS = 80% BVDSS

Electrical Characteristics up to 1000 krads (T_J= 25˚C unless otherwise noted. Typical (TYP) values are for reference only.)

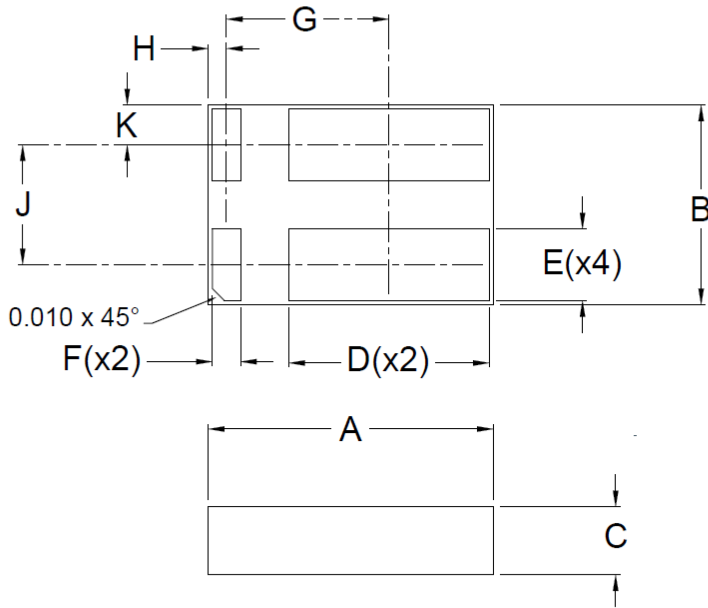
Parameter	Symbol	Test Conditions	MIN	TYP	MAX	Units
Min Drain to Source Voltage	V_{DSMin}	V_{GS} = 0 V, I_D = 1.0 mA	300			V
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 18 mA	0.8	1.4	2.5	V
Drain to Source Leakage	I_{DSS}	V_{DS} =240 V, V_{GS} = 0 V			500	µA
Gate to Source Forward Leakage	I_{GSSF}	V_{GS} = 5 V			1600	µA
Gate to Source Reverse Leakage	I_{GSSR}	V_{GS} = -4 V			500	µA
Drain to Source Resistance (Note 4)	$R_{DS(on)}$	I_D = 50 A, V_{GS} = 5 V			32	mΩ

TYPICAL SINGLE EVENT EFFECT SAFE OPERATING AREA

Test	Environment				VDS Voltage (V)	
	Ion	LET MeV/mg/cm^2	Range µm	Energy MeV	V_{GS} = 0 V	V_{GS} = -4 V
See SOA	Xe	50.8	125	1583	300	300
	Au	84.6	124	2365	250	250



Package Outline and Dimensions



SYMBOL	NOMINAL (IN)	NOMINAL (MM)	NOTE
A	0.354	8.992	
B	0.248	6.299	
C	0.083	2.108	
D	0.249	6.325	
E	0.089	2.261	
F	0.035	0.889	
G	0.202	5.131	
H	0.021	0.521	
K	0.048	1.207	
J	0.149	3.785	