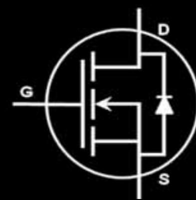
EPC1007 – Enhancement Mode Power Transistor

V_{DSS} , 100 V
$R_{DS(ON)}$, 30 mΩ
I_D , 6 A



EFFICIENT POWER CONVERSION

Gallium Nitride is grown on Silicon Wafers and processed using standard CMOS equipment leveraging the infrastructure that has been developed over the last 55 years. GaN's exceptionally high electron mobility and low temperature coefficient allows very low $R_{DS(ON)}$, while its lateral device structure and majority carrier diode provide exceptionally low Q_G and zero Q_{RR}. The end result is a device that can handle tasks where very high switching frequency, and low on-time are beneficial as well as those where on-state losses dominate.

Maximum Ratings			
V_{DS}	Drain-to-Source Voltage	100	V
I_D	Continuous (T_A = 25˚C, θ_{JA} = 90)	6	A
	Pulsed (25˚C, Tpulse = 300 µs)	25	
V_{GS}	Gate-to-Source Voltage	6	V
	Gate-to-Source Voltage	-5	
T_J	Operating Temperature	-40 to 125	˚C
T_{STG}	Storage Temperature	-40 to 150	

EPC Power Transistors are supplied only in passivated die form with solder bumps

Applications

- High Speed DC-DC conversion
- Class D Audio
- Hard Switched and High Frequency Circuits

Benefits

- Ultra High Efficiency
- Ultra Low $R_{DS(on)}$
- Ultra low Q_G
- Ultra small footprint

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Static Characteristics (T_J= 25˚C unless otherwise stated)						
BV_{DSS}	Drain-to-Source Voltage	V_{GS} = 0 V, I_D = 75 µA	100			V
I_{DSS}	Drain Source Leakage	V_{DS} = 80 V, V_{GS} = 0 V		20	60	µA
I_{GSS}	Gate-Source Forward Leakage	V_{GS} = 5 V		.25	2	mA
	Gate-Source Reverse Leakage	V_{GS} = -5 V		0.1	0.5	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 1.2 mA	0.7	1.4	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS} = 5 V, I_D = 6 A		24	30	mΩ
Dynamic Characteristics (T_J= 25˚C unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS} = 50 V, V_{GS} = 0 V		200		pF
C_{OSS}	Output Capacitance			110		
C_{RSS}	Reverse Transfer Capacitance			10		
Q_G	Total Gate Charge (V_{GS} = 5 V)	V_{DS} = 50 V, I_D = 6 A		2.7		nC
Q_{GD}	Gate-to-drain Charge			1		
Q_{GS}	Gate-to Source Charge			0.75		
Q_{OSS}	Output Charge			8		
Q_{RR}	Source-Drain Recovery Charge			0		
Source-Drain Characteristics (T_J= 25˚C unless otherwise stated)						
V_{SD}	Source-Drain Forward Voltage	I_S = 0.5 A, V_{GS} = 0 V, T = 25˚C		1.8		V
		I_S = 0.5 A, V_{GS} = 0 V, T = 125˚C		1.75		

Figure 1: Typical Output Characteristics

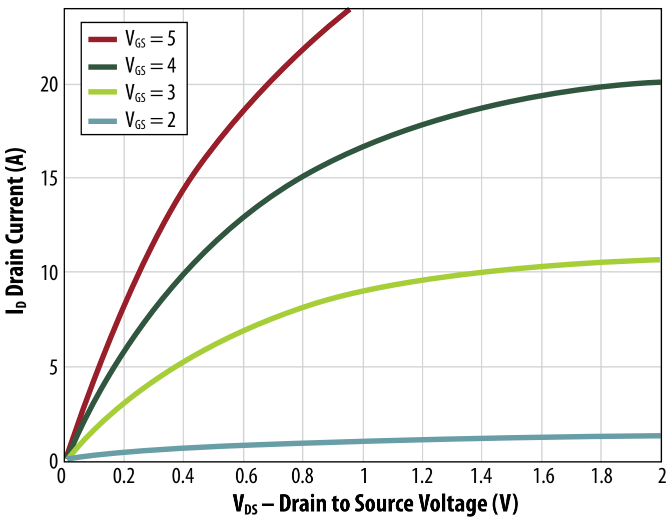


Figure 2: Transfer Characteristics

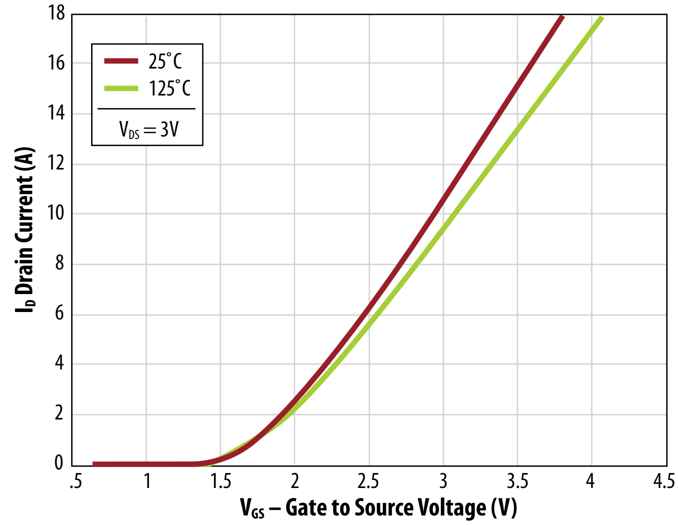


Figure 3: $R_{DS(ON)}$ vs V_G for Various Current

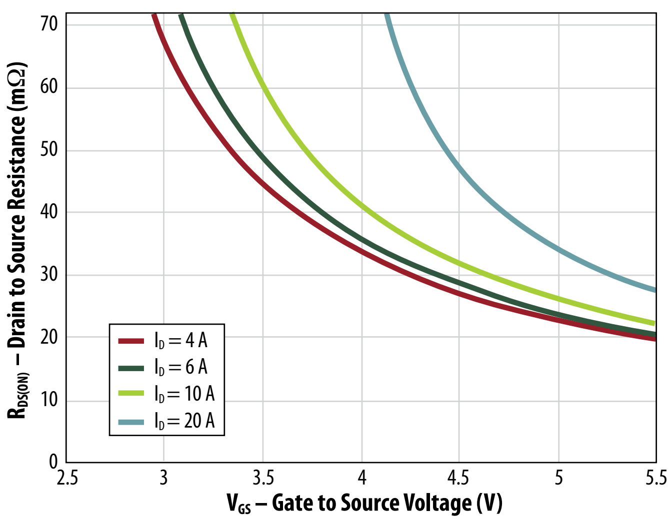


Figure 4: $R_{DS(ON)}$ vs V_G for Various Temperature

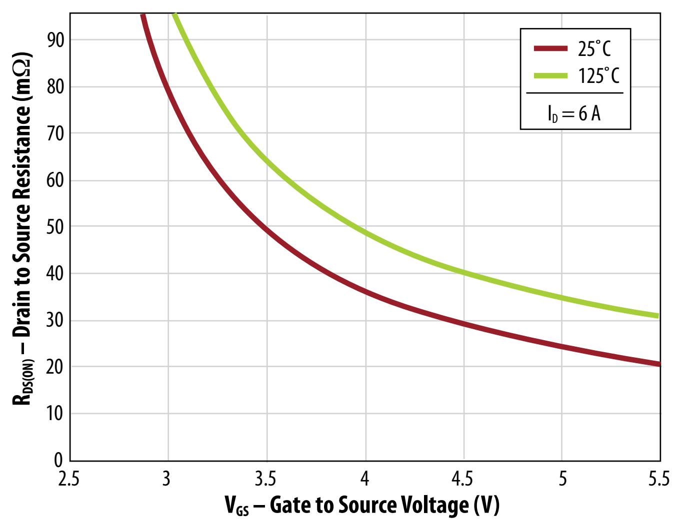


Figure 5: Capacitance

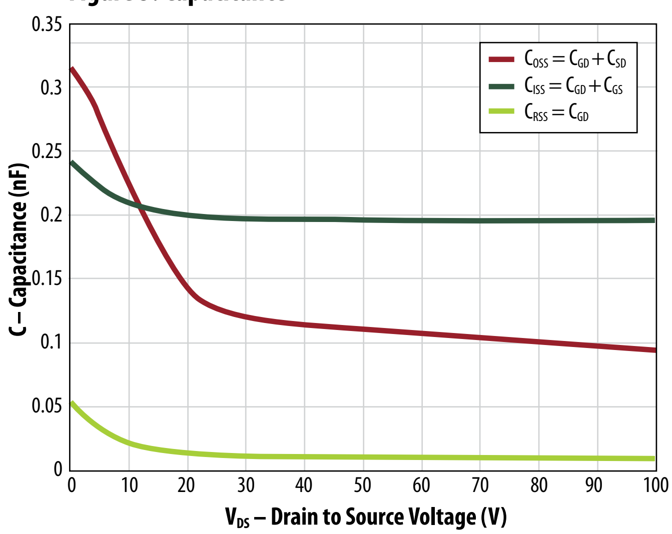


Figure 6: Gate Charge

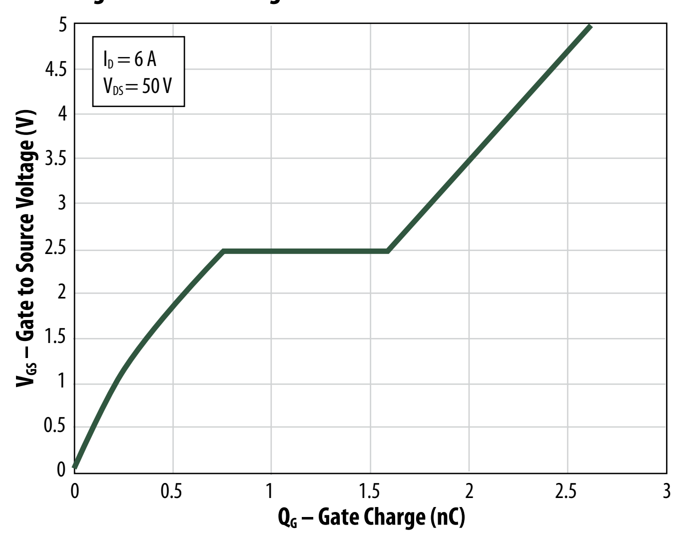


Figure 7: Reverse Drain-Source Characteristics

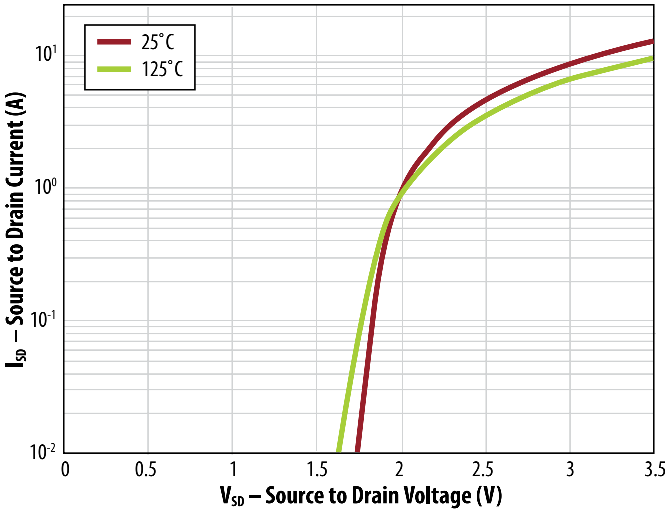


Figure 8: Normalized On Resistance Vs Temperature

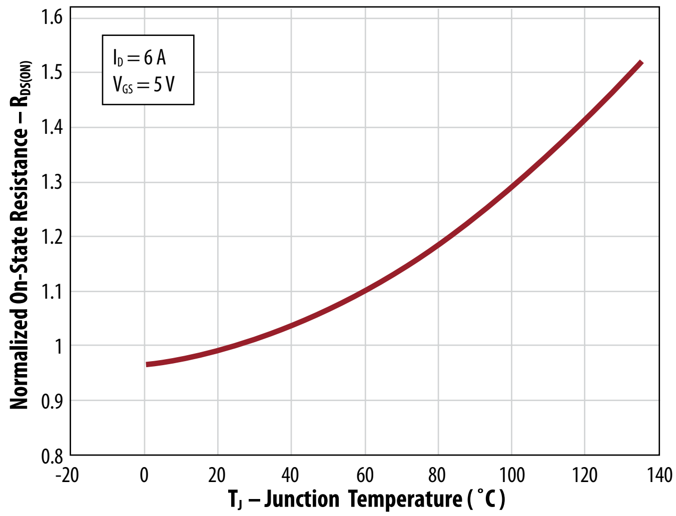


Figure 9: Normalized Threshold Voltage

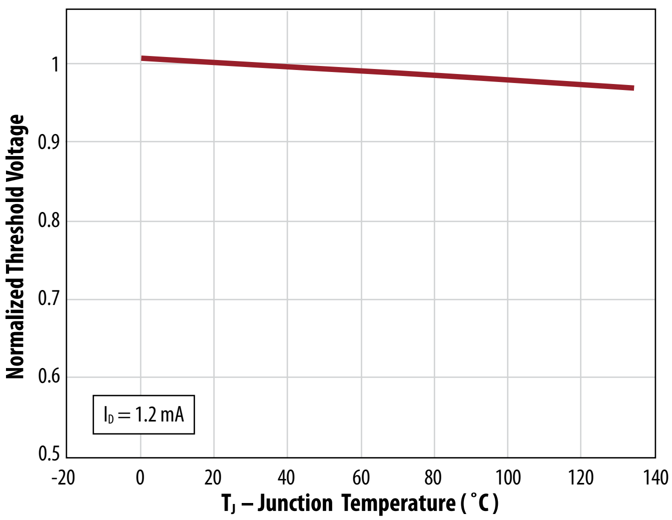
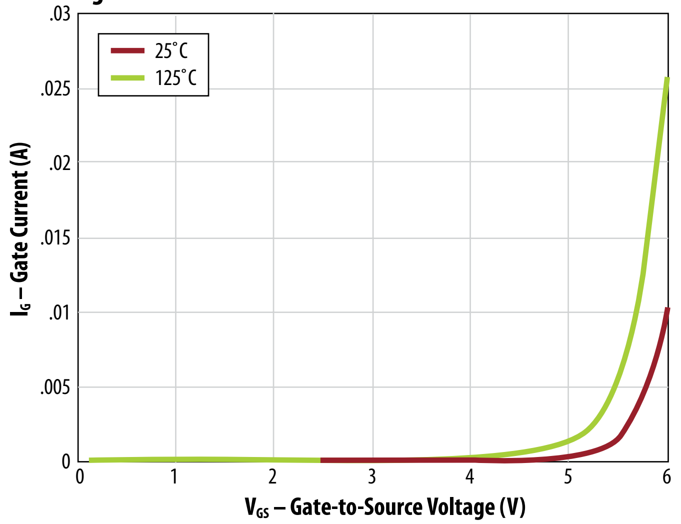
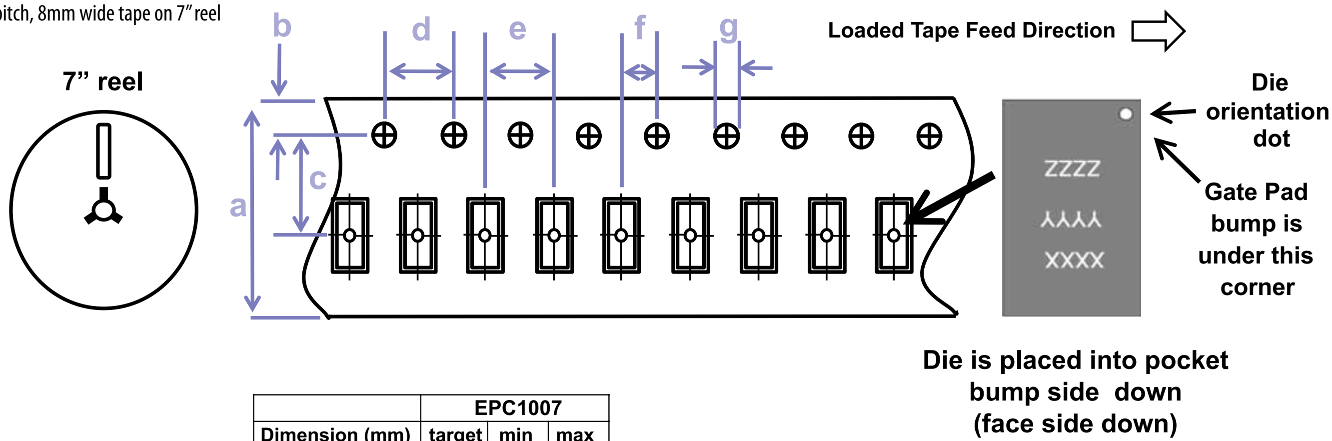


Figure10: Gate Current



TAPE AND REEL CONFIGURATION

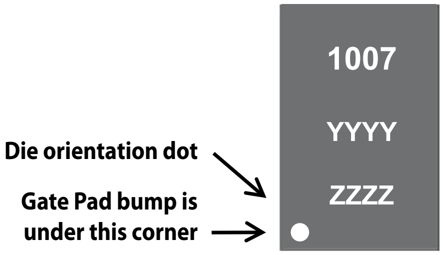
4mm pitch, 8mm wide tape on 7" reel



	EPC1007		
Dimension (mm)	target	min	max
a	8.00	7.90	8.30
b	1.75	1.65	1.85
c (see note)	3.50	3.45	3.55
d	4.00	3.90	4.10
e	4.00	3.90	4.10
f (see note)	2.00	1.95	2.05
g	1.5	1.5	1.6

Note: Pocket position is relative to the sprocket hole measured as true position of the pocket, not the pocket hole

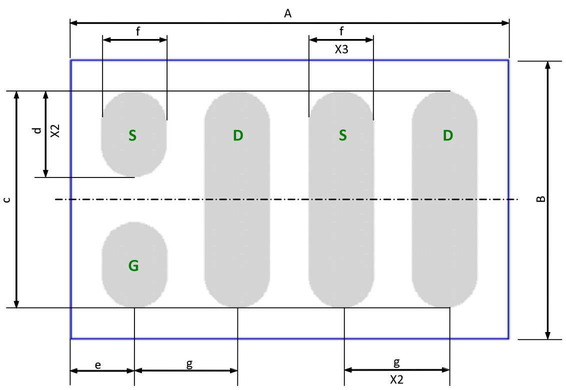
DIE MARKINGS



Part Number	Laser Markings		
	Part # Marking Line 1	Lot_Date Code Marking line 2	Lot_Date Code Marking Line 3
EPC1007	1007	YYYY	ZZZZ

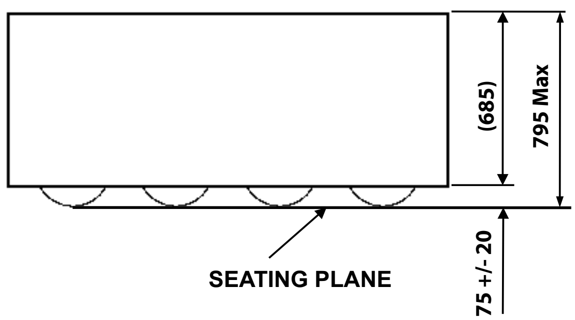
DIE OUTLINE

Bottom View



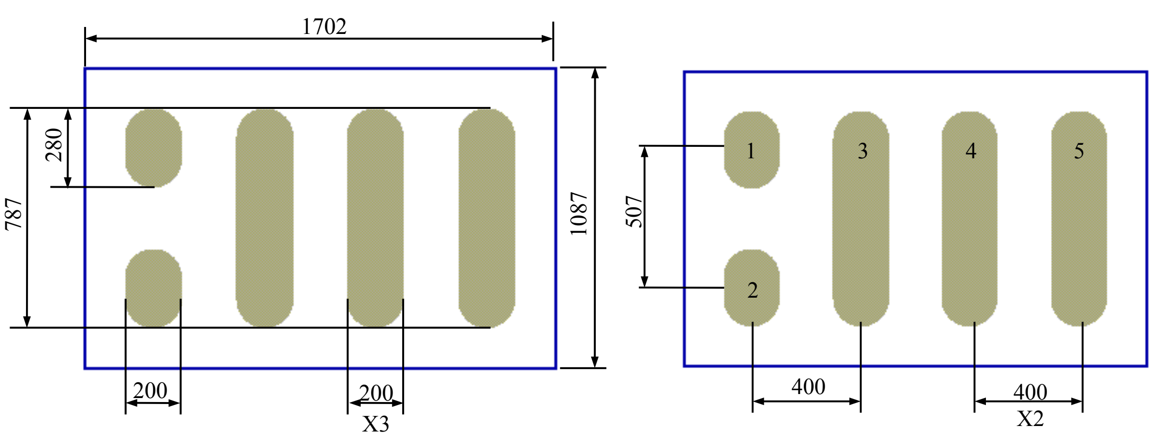
DIM	MICROMETERS		
	MIN	Nominal	MAX
A	1672	1702	1732
B	1057	1087	1117
c	834	837	840
d	327	330	333
e	235	250	265
f	248	250	252
g	400	400	400

Side View



RECOMMENDED LAND PATTERN

(measurements in µm)



Pad no. 1 is Gate;

Pads no. 3 and 5 are Drain;

Pads no. 2 and 4 are Source.