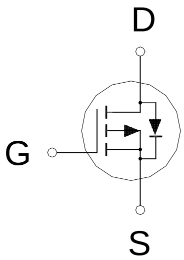
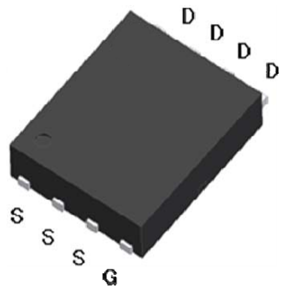
P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	-20V
R_{DSON} (MAX.)	3.2mΩ
I_D	-100A





UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current[1]	T_C = 25 °C	I_D	-100	A
	T_C = 100 °C		-73	
Pulsed Drain Current[2]		I_{DM}	-400	
Avalanche Current		I_{AS}	-100	
Avalanche Energy	L = 0.1mH, ID=-100A, RG=25Ω	E_{AS}	500	mJ
Repetitive Avalanche Energy[3]	L = 0.05mH	E_{AR}	250	
Power Dissipation	T_C = 25 °C	P_D	69	W
	T_C = 100 °C		27	
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=-5V, I_L=-70A, Rated V_{DS}=-20V P-CH

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		1.8	°C / W
Junction-to-Ambient[4]	$R_{\theta JA}$		50	

[1]Package Limited.

[2]Pulse width limited by maximum junction temperature.

[3]Duty cycle ≤ 1%

[4]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	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250µA	-0.4	-0.6	-1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16V, V_{GS} = 0V			-1	µA
		V_{DS} = -12V, V_{GS} = 0V, T_J = 125 °C			-10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -4.5V	-100			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -10V, I_D = -20A		2.4	2.7	mΩ
		V_{GS} = -4.5V, I_D = -20A		2.7	3.2	
		V_{GS} = -2.5V, I_D = -20A		3.4	4.1	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -20A		65		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz		11116		pF
Output Capacitance	C_{oss}			1303		
Reverse Transfer Capacitance	C_{rss}			592		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		3		Ω
Total Gate Charge[1,2]	$Q_g(V_{GS}$=-10V)	V_{DS} = -10V, V_{GS} = -10V, I_D = -20A		202		nC
	$Q_g(V_{GS}$=-4.5V)			87		
Gate-Source Charge[1,2]	Q_{gs}			18		
Gate-Drain Charge[1,2]	Q_{gd}			16		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = -10V, I_D = -1A, V_{GS} = -10V, R_{GS} = 3Ω		20		nS
Rise Time[1,2]	t_r			55		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			270		
Fall Time[1,2]	t_f			100		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				-100	A
Pulsed Current[3]	I_{SM}				-400	
Forward Voltage[1]	V_{SD}	I_F = -20A, V_{GS} = 0V			-1.2	V
Reverse Recovery Time	t_{rr}	I_F = -20A, dI_F/dt = 100A / µS		50		nS
Reverse Recovery Charge	Q_{rr}			180		nC

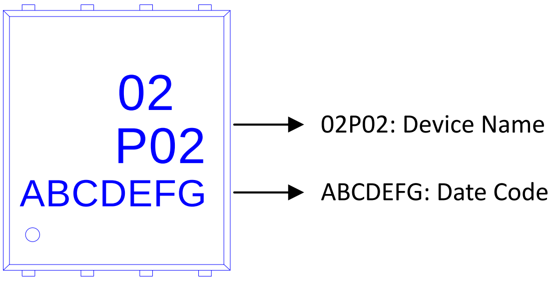
[1]Pulse test : Pulse Width ≤300μ sec, Duty Cycle ≤ 2%.

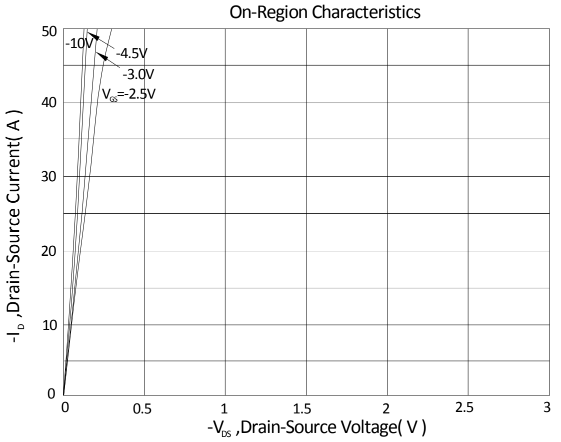
[2]Independent of operating temperature.

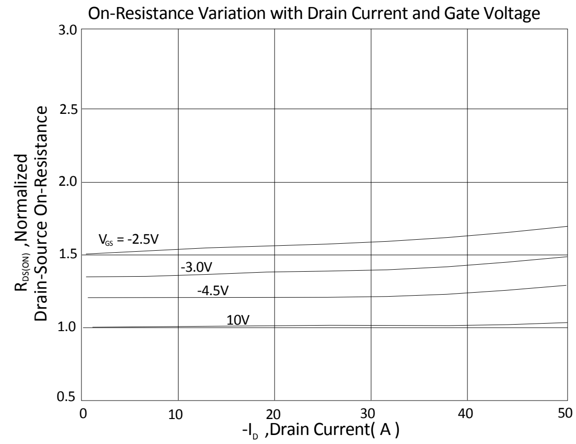
[3]Pulse width limited by maximum junction temperature.

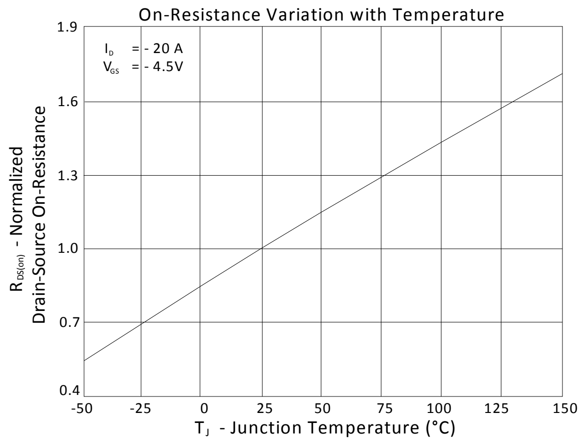
Ordering & Marking Information:

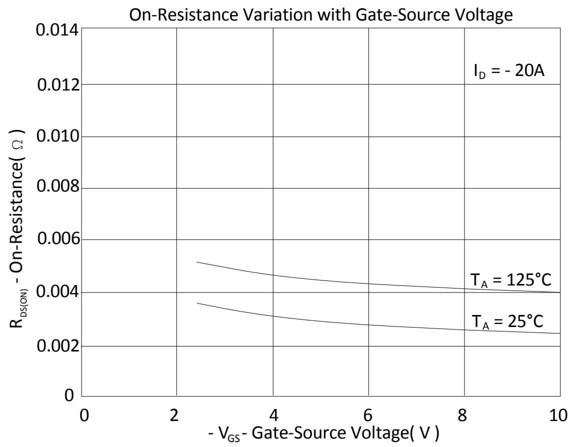
Device Name: LB02P02C for EDFN 5 x 6

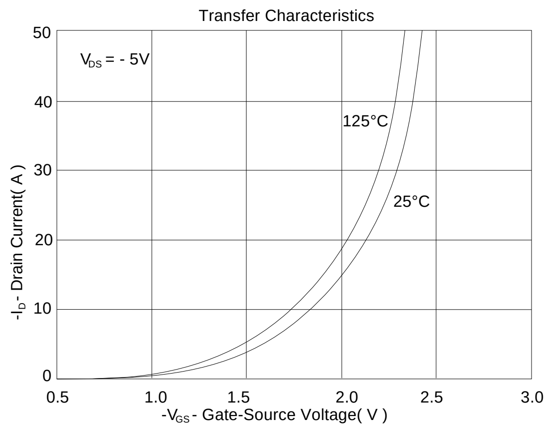


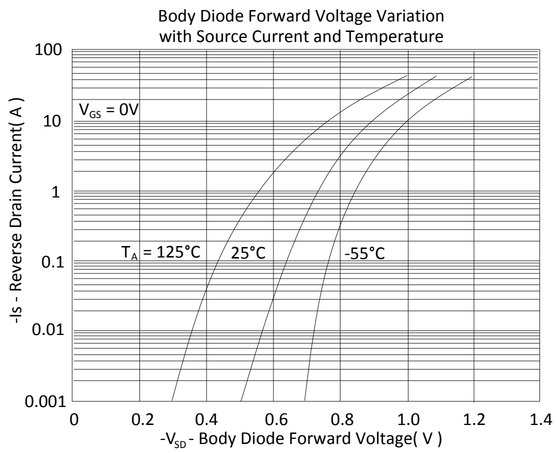

On-Region Characteristics
-10V
-4.5V
-3.0V
V_{GS}=-2.5V
-I_D ,Drain-Source Current(A)
-V_{DS} ,Drain-Source Voltage(V)


On-Resistance Variation with Drain Current and Gate Voltage
V_{GS} = -2.5V
-3.0V
-4.5V
10V
$R_{DS(ON)}$,Normalized Drain-Source On-Resistance
-I_D ,Drain Current(A)

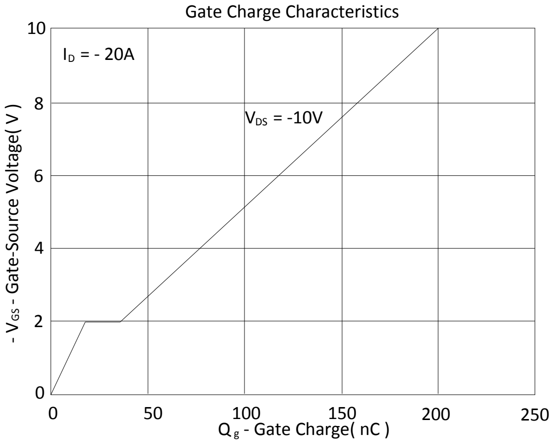

On-Resistance Variation with Temperature
I_D = - 20 A
V_{GS} = - 4.5V
$R_{DS(on)}$ - Normalized Drain-Source On-Resistance
T_J - Junction Temperature (°C)


On-Resistance Variation with Gate-Source Voltage
I_D = - 20A
T_A = 125°C
T_A = 25°C
$R_{DS(ON)}$ - On-Resistance(Ω)
- V_{GS} - Gate-Source Voltage(V)

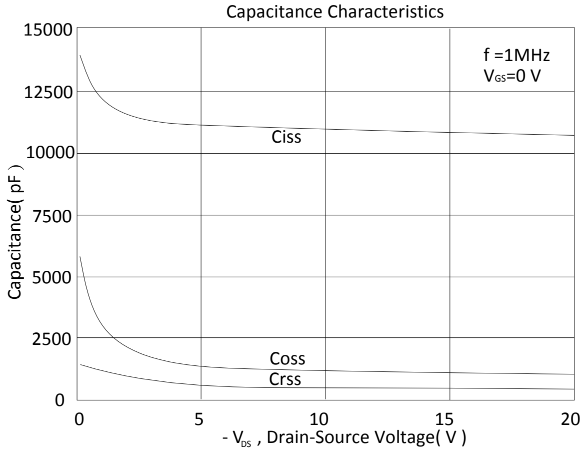

Transfer Characteristics
V_{DS} = - 5V
125°C
25°C
-I_D - Drain Current(A)
-V_{GS} - Gate-Source Voltage(V)


Body Diode Forward Voltage Variation with Source Current and Temperature
V_{GS} = 0V
T_A = 125°C
25°C
-55°C
-Is - Reverse Drain Current(A)
-V_{SD} - Body Diode Forward Voltage(V)

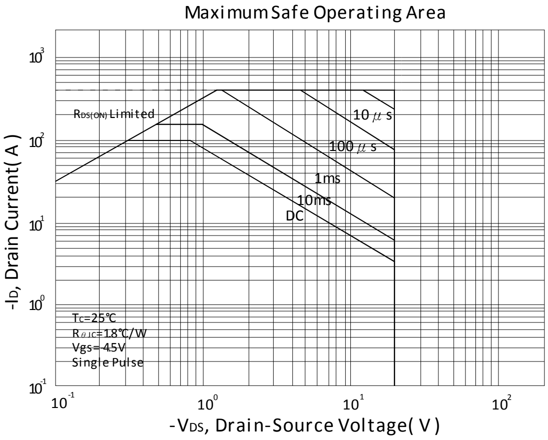
Gate Charge Characteristics



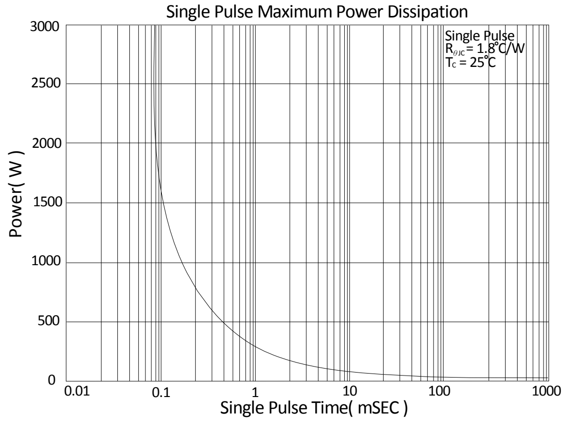
Capacitance Characteristics



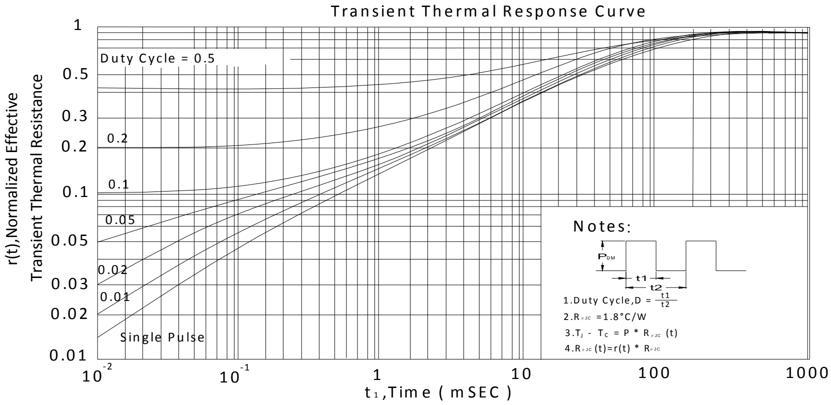
Maximum Safe Operating Area



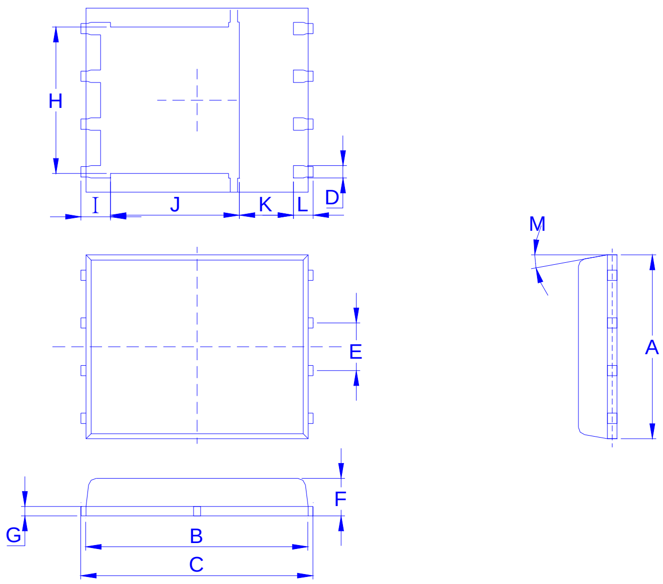
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



Outline Drawing



Dimension in mm

Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M
Min.	4.80	5.50	5.90	0.3		0.85	0.15	3.67	0.41	3.00	0.94	0.45	0°
Typ.					1.27								
Max.	5.30	5.90	6.15	0.51		1.20	0.30	4.54	0.85	3.92	1.7	0.71	12°

Recommended minimum pads