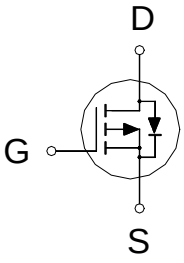
P-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	-20V
$R_{DSON\ (MAX.)}$	9.5mΩ
I_D	-20A



Pb-Free Lead Plating & Halogen Free

GP
GREEN PRODUCT

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current	T_A = 25 °C	I_D	-20	A
	T_A = 70 °C		-15	
Pulsed Drain Current[1]		I_{DM}	-80	
Avalanche Current		I_{AS}	-15	
Avalanche Energy	L = 0.1mH, I_D=-15A, R_G=25Ω	E_{AS}	11.25	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	5.6	
Power Dissipation	T_A = 25 °C	P_D	2.5	W
	T_A = 70 °C		1.25	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		6	°C / W
Junction-to-Ambient[3]	$R_{\theta JA}$		50	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

[3]50°C / W when mounted on a 1 in^2 pad of 2 oz copper.

ELECTRICAL CHARACTERISTICS (T_A = 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	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.4	-0.75	-1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±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	-20			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -15A		7.8	9.5	mΩ
		V_{GS} = -2.5V, I_D = -8A		10.3	12.5	
		V_{GS} = -1.8V, I_D = -5A		14.5	18	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -15A		32		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz		7660		pF
Output Capacitance	C_{oss}			596		
Reverse Transfer Capacitance	C_{rss}			510		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		3.0		Ω
Total Gate Charge[1,2]	Q_g(V_{GS}=-4.5V)	V_{DS} = -10V, V_{GS} = -4.5V, I_D = -15A		51		nC
	Q_g(V_{GS}=-2.5V)			32		
Gate-Source Charge[1,2]	Q_{gs}			4.9		
Gate-Drain Charge[1,2]	Q_{gd}			13		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = -10V, I_D = -1A, V_{GS} = -4.5V, R_{GS} = 6Ω		25		nS
Rise Time[1,2]	t_r			55		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			150		
Fall Time[1,2]	t_f			65		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				-3.5	A
Pulsed Current[3]	I_{SM}				-14	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			-1.2	V

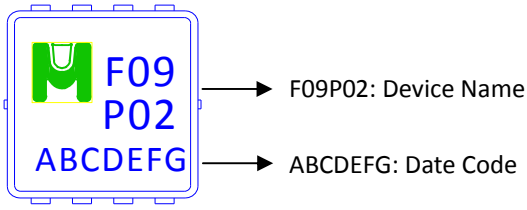
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

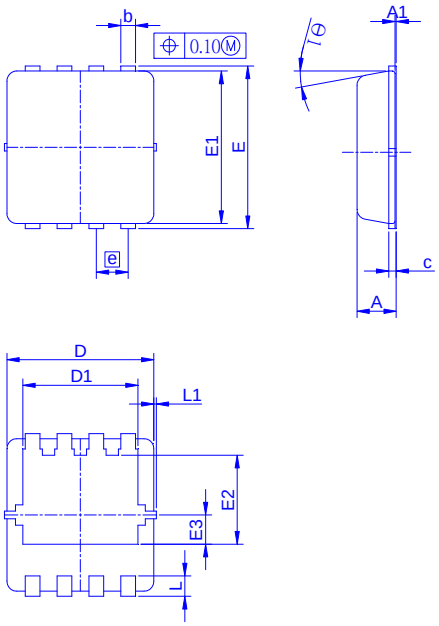
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMF09P02V for EDFN 3 x 3



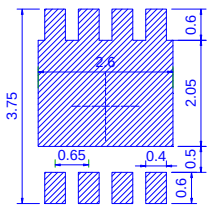
Outline Drawing



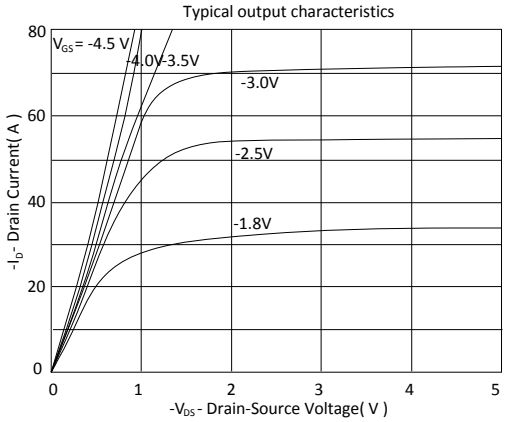
Dimension in mm

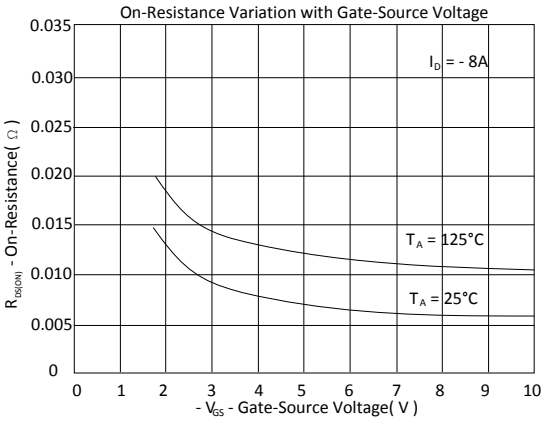
Dimension	A	A1	b	c	D	D1	E	E1	E2	E3	e	L	L1	Θ1
Min.	0.70	0	0.24	0.10	2.95	2.25	3.15	2.95	1.65			0.30		0°
Typ.	0.80		0.30	0.152	3.00	2.35	3.20	3.00	1.75	0.575	0.65	0.40	0.13	10°
Max.	0.90	0.05	0.37	0.25	3.15	2.45	3.40	3.15	1.96			0.50		12°

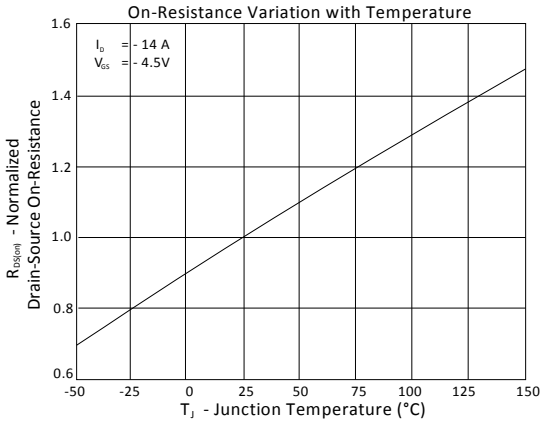
Recommended minimum pads

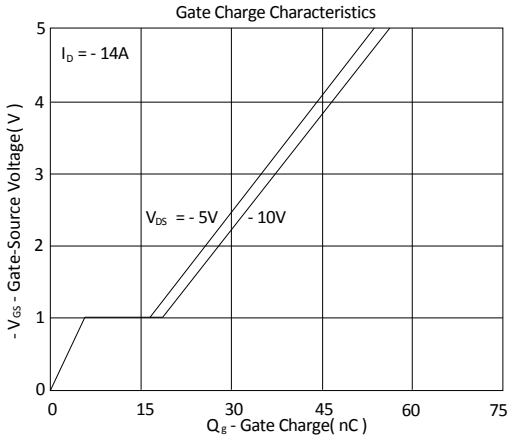


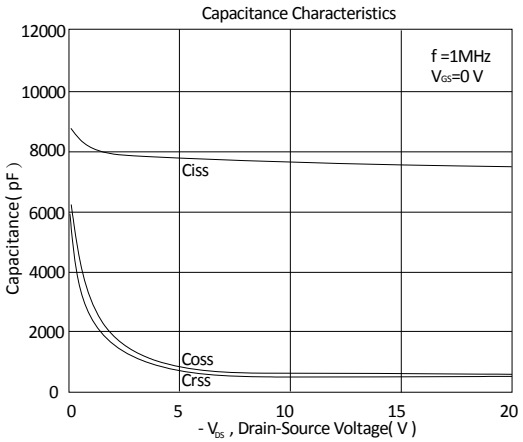
TYPICAL CHARACTERISTICS

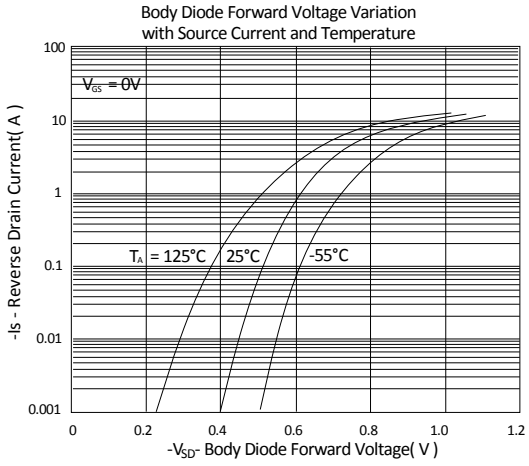




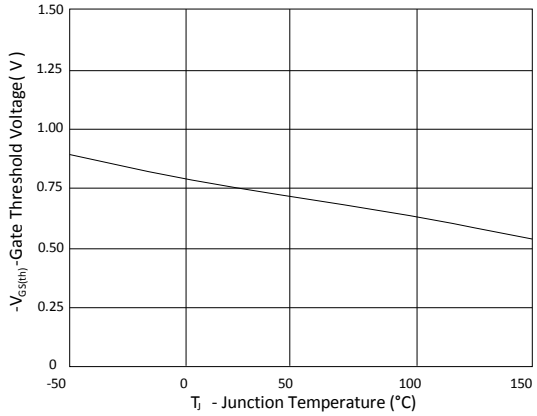




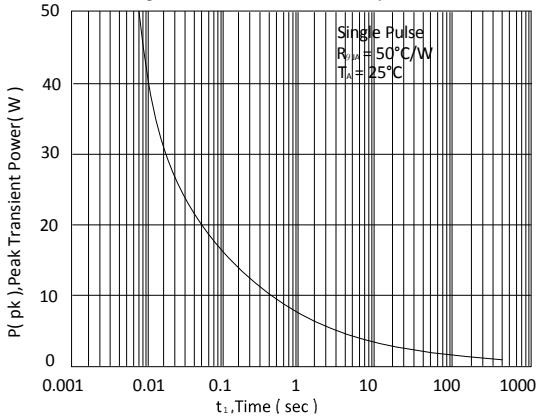




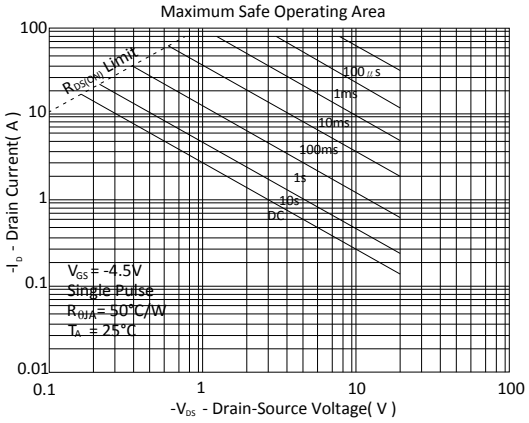
Gate Threshold Voltage v.s. Junction Temperature



Single Pulse Maximum Power Dissipation



Maximum Safe Operating Area



Transient Thermal Response Curve