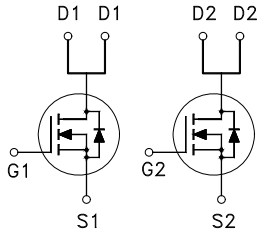
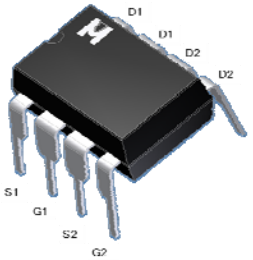
Dual N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	60V
$R_{DSON\ (MAX.)}$	60mΩ
I_D	5A





UIS, 100% Tested

Pb-Free Lead Plating

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	5	A
	T_C = 100 °C		3.6	
Pulsed Drain Current[1]		I_{DM}	20	
Avalanche Current		I_{AS}	12	
Avalanche Energy	L = 0.1mH, ID=7.5A, RG=25Ω	E_{AS}	7.2	mJ
Repetitive Avalanche Energy[2]	L = 0.05mH	E_{AR}	3.6	
Power Dissipation	T_C = 25 °C	P_D	5	W
	T_C = 100 °C		2	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

100% UIS testing in condition of V_D=30V, L=0.1mH, V_G=10V, I_L=5A, Rated V_{DS}=60V N-CH

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		25	°C / W
Junction-to-Ambient[3]	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle ≤ 1%

[3]62.5°C / W when mounted on a 1 in^2 pad of 2 oz copper.

ELECTRICAL CHARACTERISTICS (T_C = 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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	2.0	3.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	μA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 125 °C			25	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	5			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 5A		50	60	mΩ
		V_{GS} = 5V, I_D = 4A		58	75	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 5A		13		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1MHz		633		pF
Output Capacitance	C_{oss}			67		
Reverse Transfer Capacitance	C_{rss}			44		
Total Gate Charge[1,2]	Q_g	V_{DS} = 30V, V_{GS} = 10V, I_D = 5A		13.8		nC
Gate-Source Charge[1,2]	Q_{gs}			2.8		
Gate-Drain Charge[1,2]	Q_{gd}			4.0		
Turn-On Delay Time[1,2]	$t_{d(on)}$	V_{DS} = 30V, I_D = 1A, V_{GS} = 10V, R_{GS} = 6Ω		10		nS
Rise Time[1,2]	t_r			7.5		
Turn-Off Delay Time[1,2]	$t_{d(off)}$			18		
Fall Time[1,2]	t_f			6		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				2.3	A
Pulsed Current[3]	I_{SM}				9.2	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.2	V

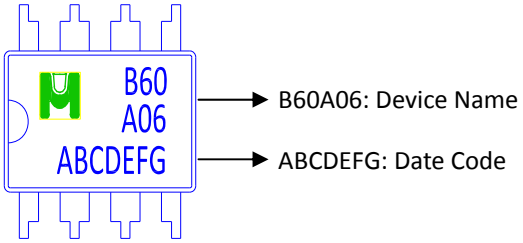
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

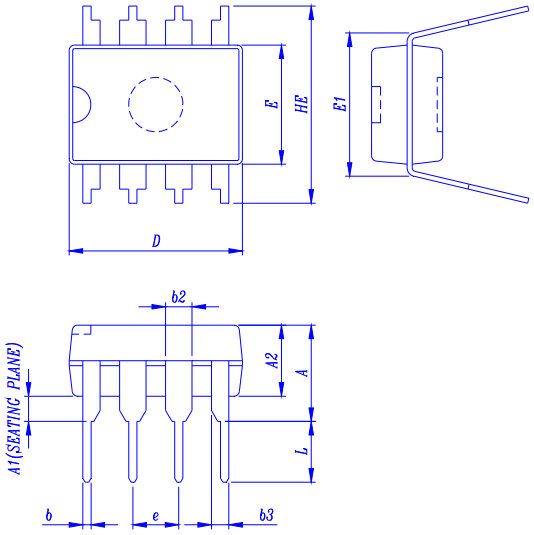
[3]Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB60A06S for DIP-8

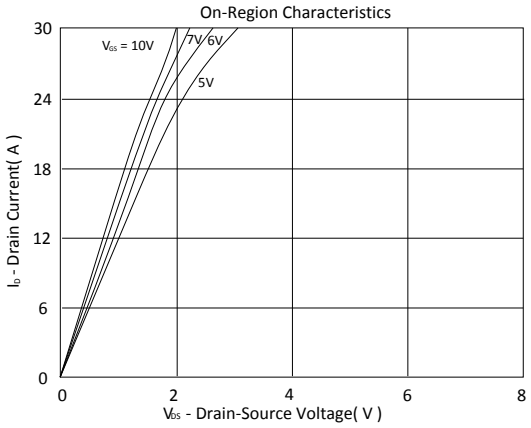


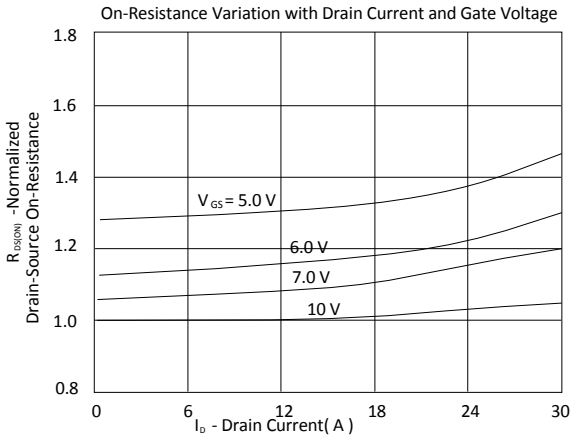
Outline Drawing

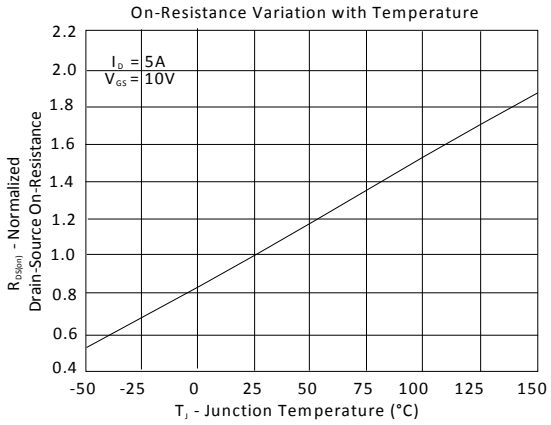


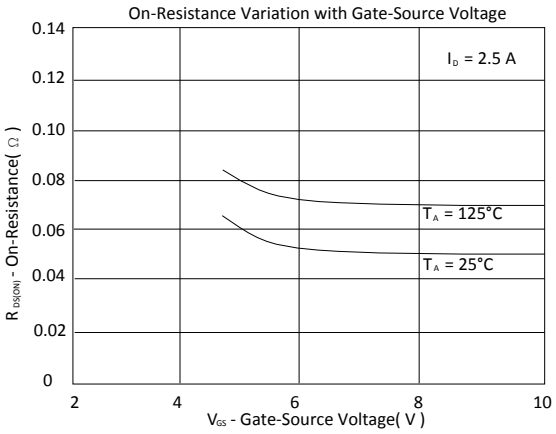
Dimension in mm

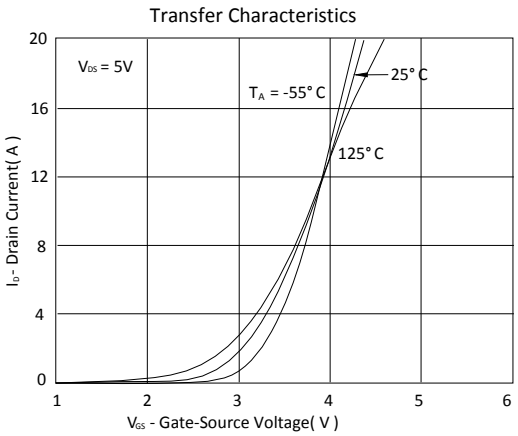
Dimension	A	A1	A2	b	b2	b3	c	D	E	E1	e	HE	L
in.		0.38	2.92	0.25	1.14	0.76	0.20	9.01	6.09	7.62			2.92
Typ.											2.54		
Max.	5.34		4.96	0.56	1.78	1.15	0.36	10.16	7.12	8.26		10.92	3.81

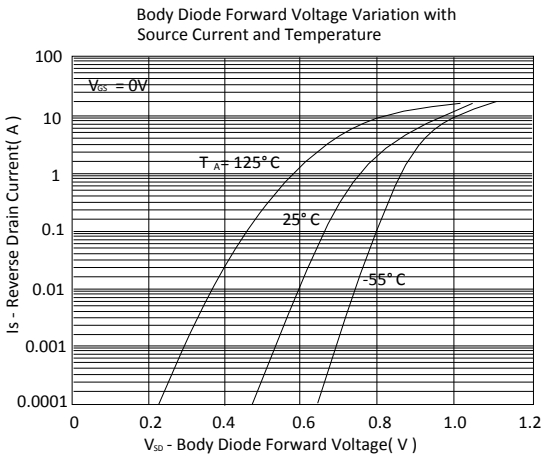

On-Region Characteristics
V_{GS} = 10V
7V
6V
5V
I_D - Drain Current(A)
V_{DS} - Drain-Source Voltage(V)


On-Resistance Variation with Drain Current and Gate Voltage
V_{GS} = 5.0 V
6.0 V
7.0 V
10 V
$R_{DS(ON)}$ -Normalized
Drain-Source On-Resistance
I_D - Drain Current(A)

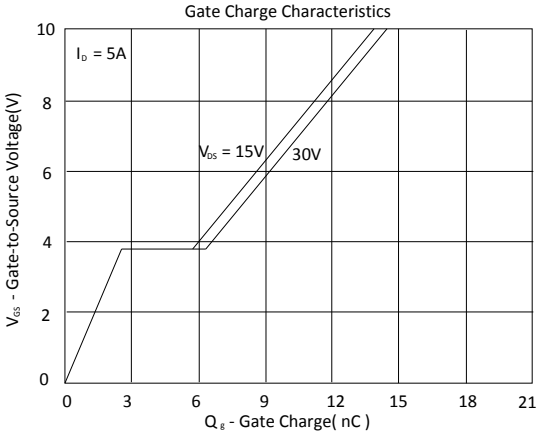

On-Resistance Variation with Temperature
I_D = 5A
V_{GS} = 10V
$R_{DS(on)}$ - Normalized
Drain-Source On-Resistance
T_J - Junction Temperature (°C)


On-Resistance Variation with Gate-Source Voltage
I_D = 2.5 A
T_A = 125°C
T_A = 25°C
$R_{DS(ON)}$ - On-Resistance(Ω)
V_{GS} - Gate-Source Voltage(V)

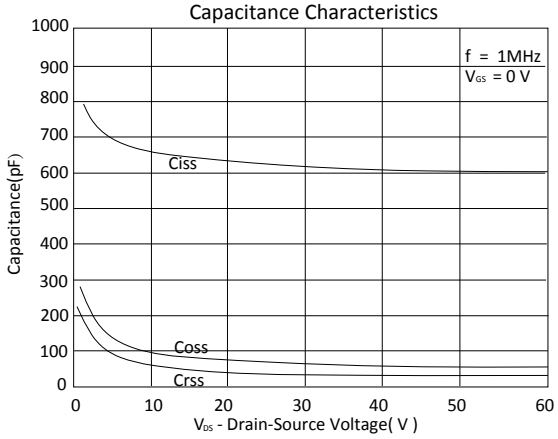

Transfer Characteristics
V_{DS} = 5V
T_A = -55° C
25° C
125° C
I_D - Drain Current(A)
V_{GS} - Gate-Source Voltage(V)


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)

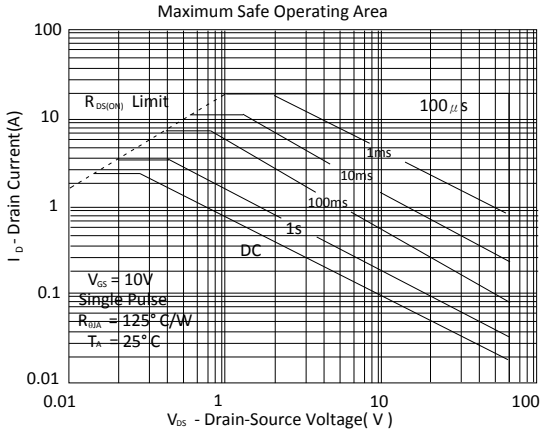
Gate Charge Characteristics



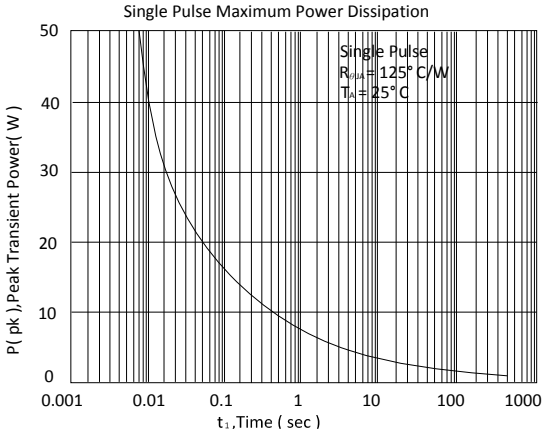
Capacitance Characteristics



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve