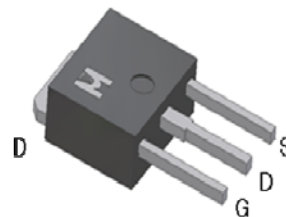
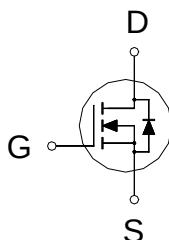


N-Channel Logic Level Enhancement Mode Field Effect Transistor

Product Summary:

BV_{DSS}	40V
$R_{DS(on)} (MAX.)$	28m Ω
I_D	12A



UIS, Rg 100% Tested

Pb-Free Lead Plating & Halogen Free



ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	12	A
	$T_C = 100^\circ\text{C}$		8	
Pulsed Drain Current ¹		I_{DM}	48	
Avalanche Current		I_{AS}	10	mJ
Avalanche Energy	$L = 0.1\text{mH}, I_D = 10\text{A}, R_G = 25\Omega$	E_{AS}	5	
Repetitive Avalanche Energy ²	$L = 0.05\text{mH}$	E_{AR}	2.5	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	30	W
	$T_C = 100^\circ\text{C}$		12	
Operating Junction & Storage Temperature Range		T_{j}, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		4.1	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		80	

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$, 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	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	2.0	3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32V, V _{GS} = 0V			1	μA
		V _{DS} = 30V, V _{GS} = 0V, T _J = 125 °C			25	
On-State Drain Current ¹	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	12			A
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = 10V, I _D = 10A		24	28	mΩ
		V _{GS} = 4.5V, I _D = 8A		38	45	
Forward Transconductance ¹	g _{fs}	V _{DS} = 5V, I _D = 10A		19		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz		527		pF
Output Capacitance	C _{oss}			81		
Reverse Transfer Capacitance	C _{rss}			59		
Gate Resistance	R _g	V _{GS} = 15mV, V _{DS} = 0V, f = 1MHz		2.5		Ω
Total Gate Charge ^{1,2}	Q _g	V _{DS} = 20V, V _{GS} = 10V, I _D = 10A		13.7		nC
Gate-Source Charge ^{1,2}	Q _{gs}			2.1		
Gate-Drain Charge ^{1,2}	Q _{gd}			4.2		
Turn-On Delay Time ^{1,2}	t _{d(on)}	V _{DS} = 20V, I _D = 1A, V _{GS} = 10V, R _{GS} = 6Ω		10		nS
Rise Time ^{1,2}	t _r			8.5		
Turn-Off Delay Time ^{1,2}	t _{d(off)}			13		
Fall Time ^{1,2}	t _f			15		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T _c = 25 °C)						
Continuous Current	I _S				12	A
Pulsed Current ³	I _{SM}				48	
Forward Voltage ¹	V _{SD}	I _F = I _S , V _{GS} = 0V			1.3	V
Reverse Recovery Time	t _{rr}	I _F = 5A, dI _F /dt = 100A / μS		15		nS
Reverse Recovery Charge	Q _{rr}			8		nC

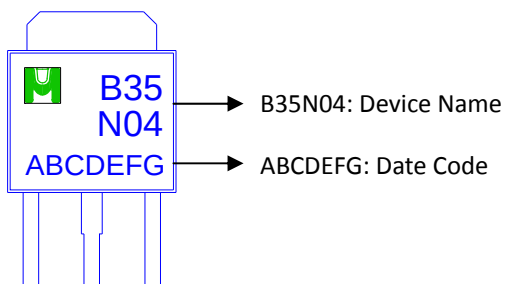
¹Pulse test : Pulse Width $\leq 300 \mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

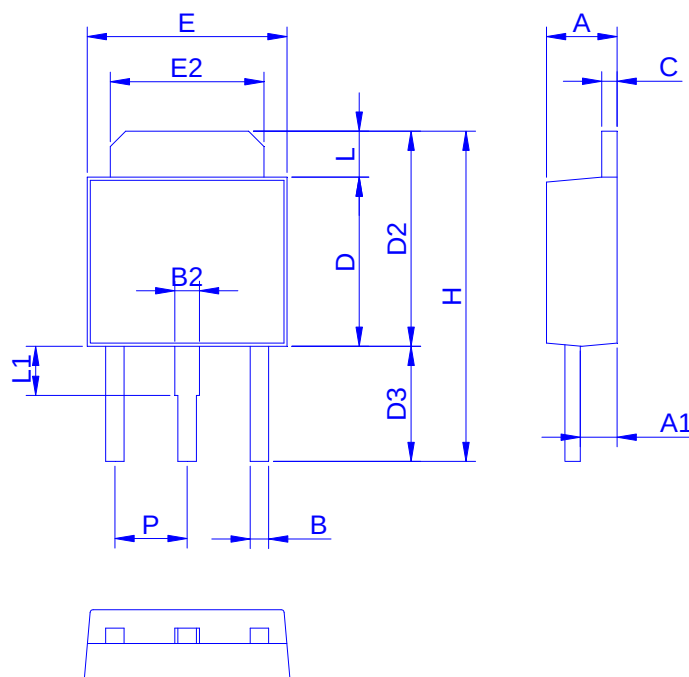
³Pulse width limited by maximum junction temperature.

Ordering & Marking Information:

Device Name: EMB35N04CS for IPAK (TO-251)



Outline Drawing



Dimension in mm

Dimension	A	A1	B	B2	C	D	D2	D3	E	E2	H	L	L1	P
Min.	2.10	0.90	0.40	0.60	0.40	5.30	6.70	3.40	6.30	4.80	10.2	0.89	0.90	2.10
Max.	2.50	1.50	0.90	1.15	0.60	6.25	7.30	4.30	6.80	5.50	11.5	1.40	1.80	2.50



TYPICAL CHARACTERISTICS

