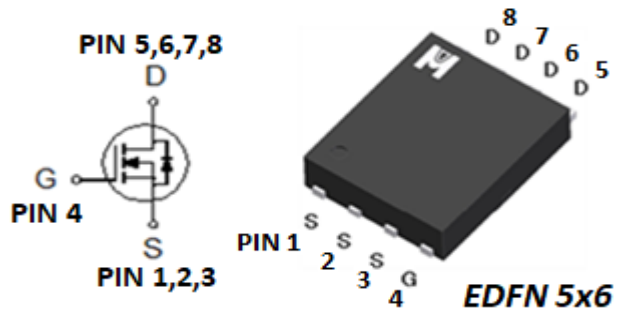


Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

•Product Summary:

	N-CH
BVDSS	100V
$R_{DS(on)}(MAX.)@V_{GS}=10V$	5.5mΩ
$R_{DS(on)}(MAX.)@V_{GS}=4.5V$	7.5mΩ
$I_D @T_C=25^{\circ}C$	122.0A
$I_D @T_A=25^{\circ}C$	16.0A

• Pin Description:



Single N Channel MOSFET

UIS, Rg 100% Tested

RoHS & Halogen Free & TSCA Compliant



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNIT
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}C$	I_D	122	A
	$T_C = 100^{\circ}C$		77	
Continuous Drain Current	$T_A = 25^{\circ}C$	I_D	16	
	$T_A = 70^{\circ}C$		13	
Pulsed Drain Current ¹		I_{DM}	196	
Avalanche Current		I_{AS}	36	mJ
Avalanche Energy	$L = 0.1mH$	EAS	64.8	
Repetitive Avalanche Energy ²	$L = 0.05mH$	EAR	32.4	
Power Dissipation	$T_C = 25^{\circ}C$	P_D	138.9	W
	$T_C = 100^{\circ}C$		55.6	
Power Dissipation	$T_A = 25^{\circ}C$	P_D	2.5	W
	$T_A = 70^{\circ}C$		1.6	
Operating Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}C$

• 100% UIS testing in condition of $V_D=50V$, $L=0.3mH$, $V_G=10V$, $I_L=22A$, Rated $V_{DS}=100V$ N-CH

•THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		0.9	$^{\circ}C/W$
Junction-to-Ambient ³	$R_{\theta JA}$		50	

¹Pulse width limited by maximum junction temperature.

²Duty cycle < 1%

³The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^{\circ}C$.

⁴Guarantee by Engineering test



•ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage ⁴	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250uA	100			V
Gate Threshold Voltage ⁴	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	1.5	2	2.5	
Gate-Body Leakage ⁴	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current ⁴	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V			1	uA
		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	122			A
Drain-Source On-State Resistance ^{1,4}	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A		4.8	5.5	mΩ
		V _{GS} = 4.5V, I _D = 20A		5.7	7.5	
Forward Transconductance ¹	g _{fs}	V _{DS} = 5V, I _D = 20A		25		S
DYNAMIC						
Input Capacitance ⁵	C _{iss}	V _{GS} = 0V, V _{DS} = 50V, f = 1MHz		3421		pF
Output Capacitance ⁵	C _{oss}			620		
Reverse Transfer Capacitance ⁵	C _{rss}			30		
Gate Resistance ^{4,5}	R _g	f = 1MHz		0.7		Ω
Total Gate Charge ^{1,2,5}	Q _g (V _{GS} =10V)	V _{DS} = 50V, V _{GS} = 10V, I _D = 20A		52.4		nC
	Q _g (V _{GS} =4.5V)			28.1		
Gate-Source Charge ^{1,2,5}	Q _{gs}			9.4		
Gate-Drain Charge ^{1,2,5}	Q _{gd}			11.5		
Turn-On Delay Time ^{1,2,5}	t _{d(on)}	V _{DS} = 50V, V _{GS} = 10V, I _D = 5A , R _g = 6Ω		11.5		nS
Rise Time ^{1,2,5}	t _r			7.2		
Turn-Off Delay Time ^{1,2,5}	t _{d(off)}			27.0		
Fall Time ^{1,2,5}	t _f			36.3		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I _S				122	A
Pulsed Current ³	I _{SM}				196	
Forward Voltage ^{1,4}	V _{SD}	I _F = 30A, V _{GS} = 0V			1.2	V
Reverse Recovery Time ⁵	t _{rr}	I _F = 30A, dI _F /dt = 100A / uS		66.1		nS
Peak Reverse Recovery Current ⁵	I _{RM(REC)}			2.39		A
Reverse Recovery Charge ⁵	Q _{rr}			89.3		nC

¹Pulse test : Pulse Width ≤ 300 usec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

³Pulse width limited by maximum junction temperature.

⁴Guarantee by FT test Item

⁵Guarantee by Engineering test

EMC will review datasheet by quarter, and update new version.



▪ TYPICAL CHARACTERISTICS

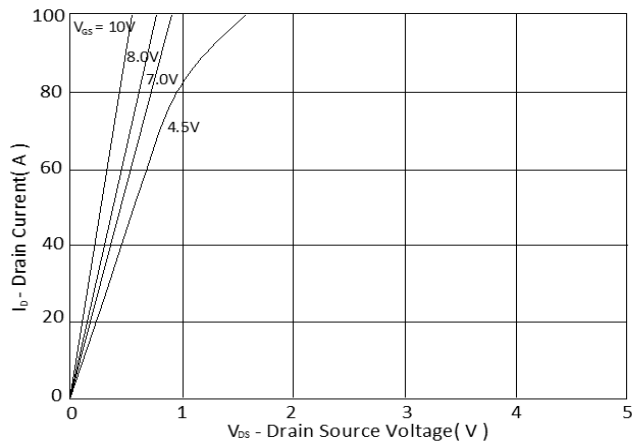


Fig.1 Typical Output Characteristics

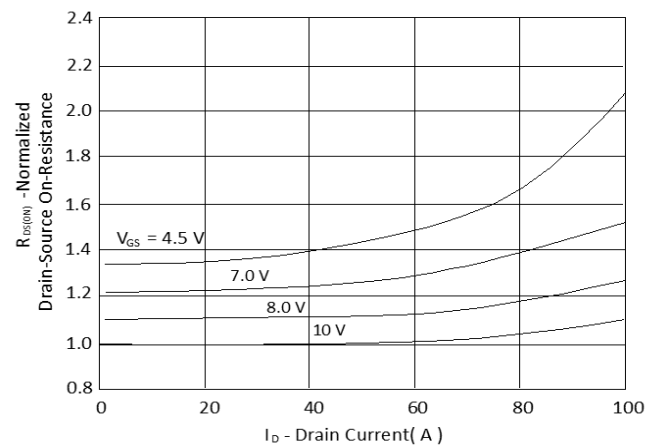


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

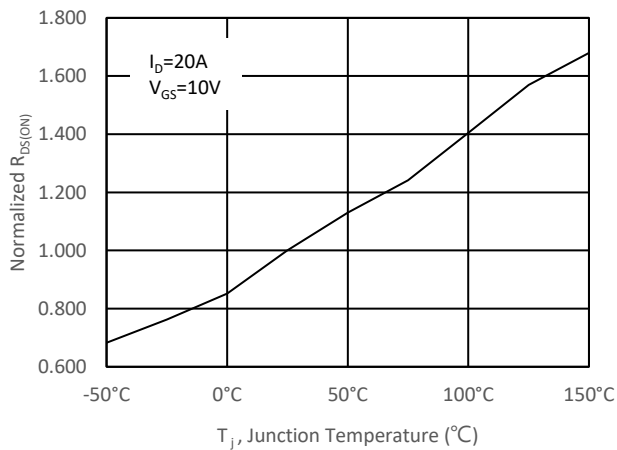


Fig.3 Normalized On-Resistance v.s. Junction Temperature

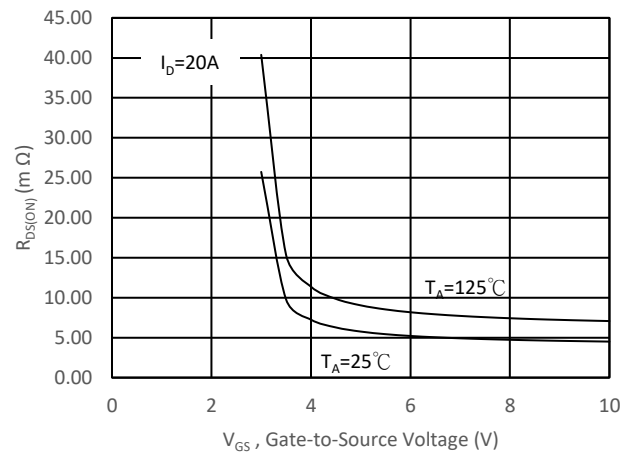


Fig.4 On-Resistance v.s. Gate Voltage

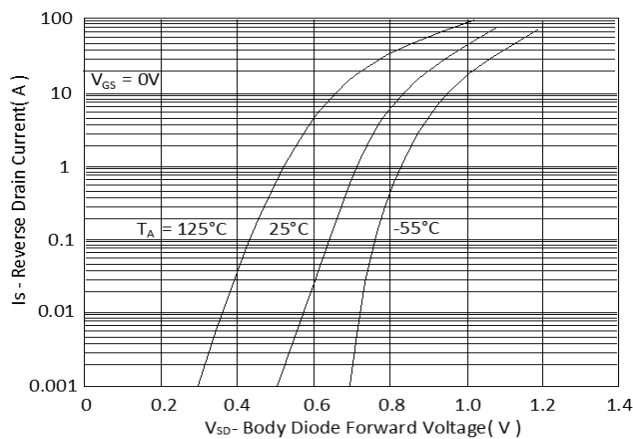


Fig.5 Forward Characteristic of Reverse Diode

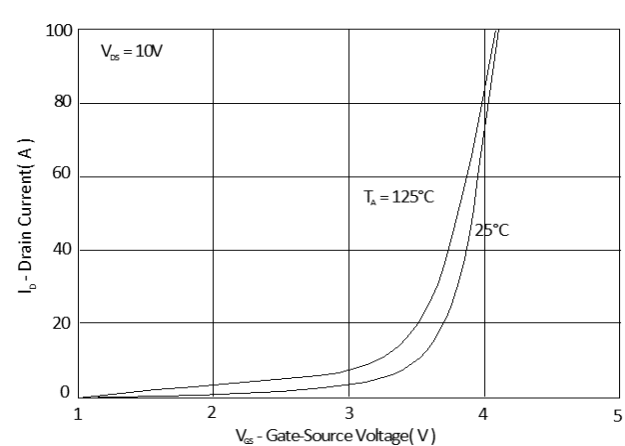
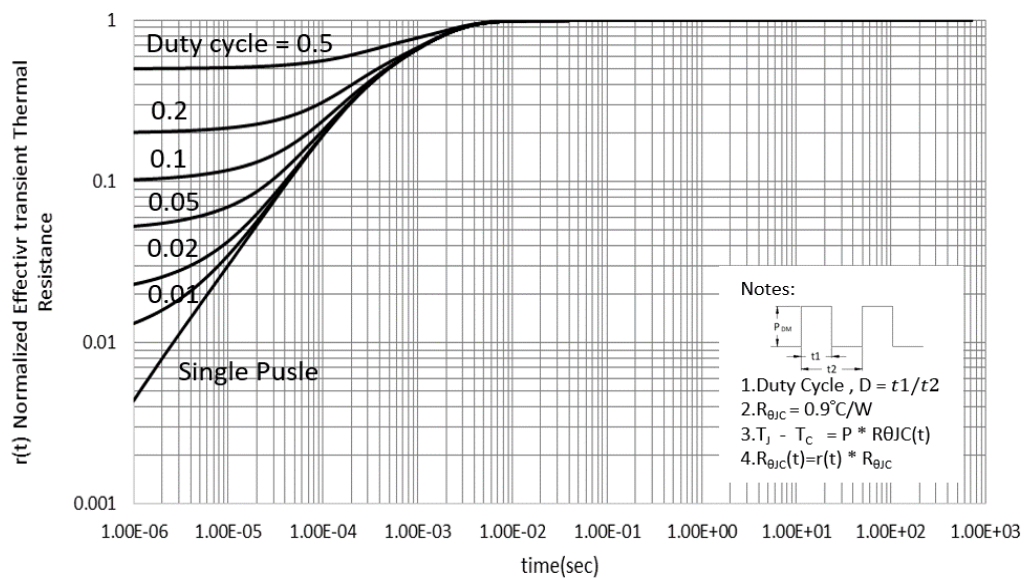
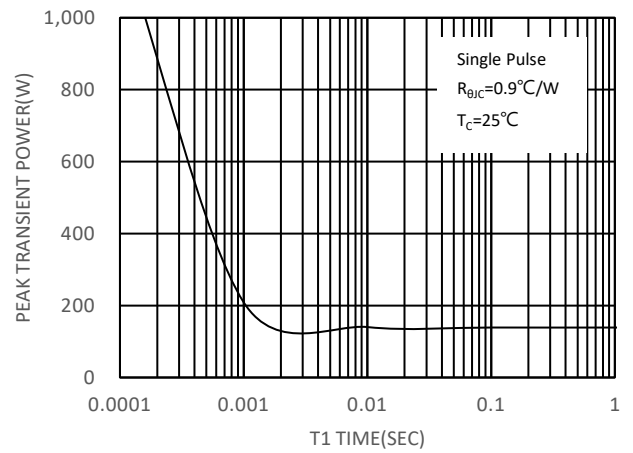
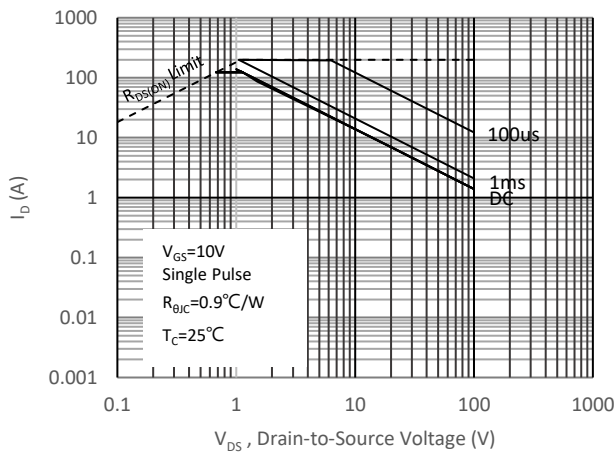
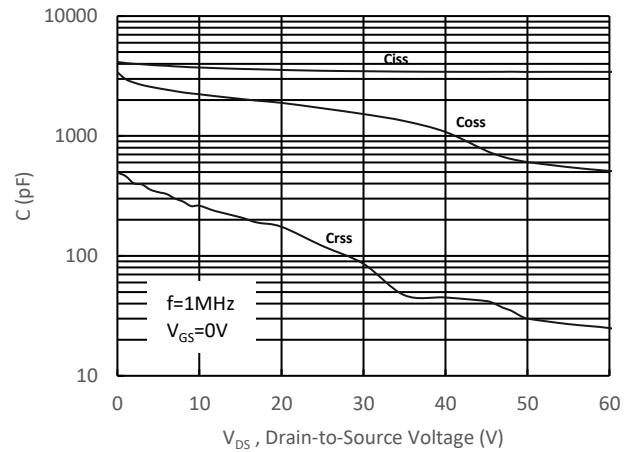
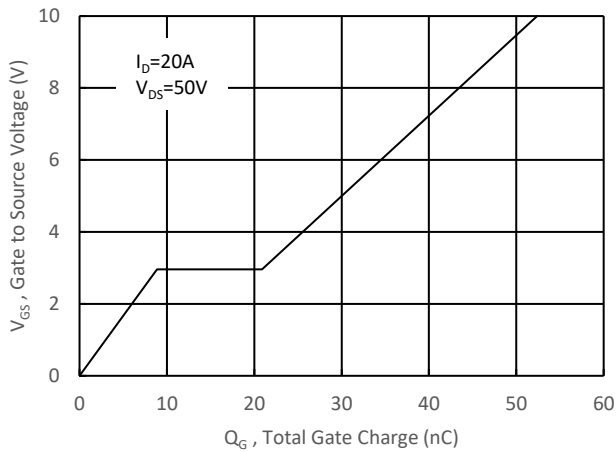
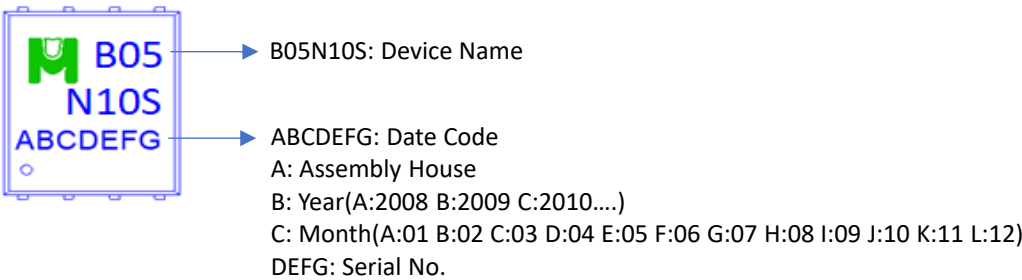


Fig.6 Transfer Characteristics

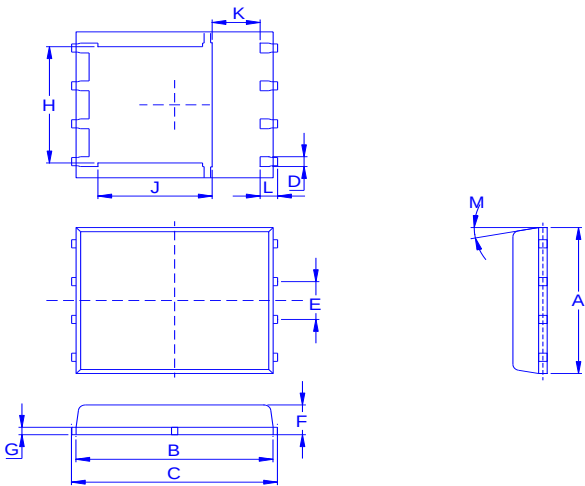


Ordering & Marking Information:

Device Name: EMB05N10HS for EDFN 5x6

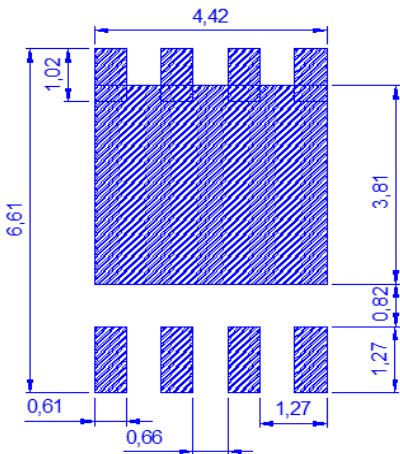


Outline Drawing

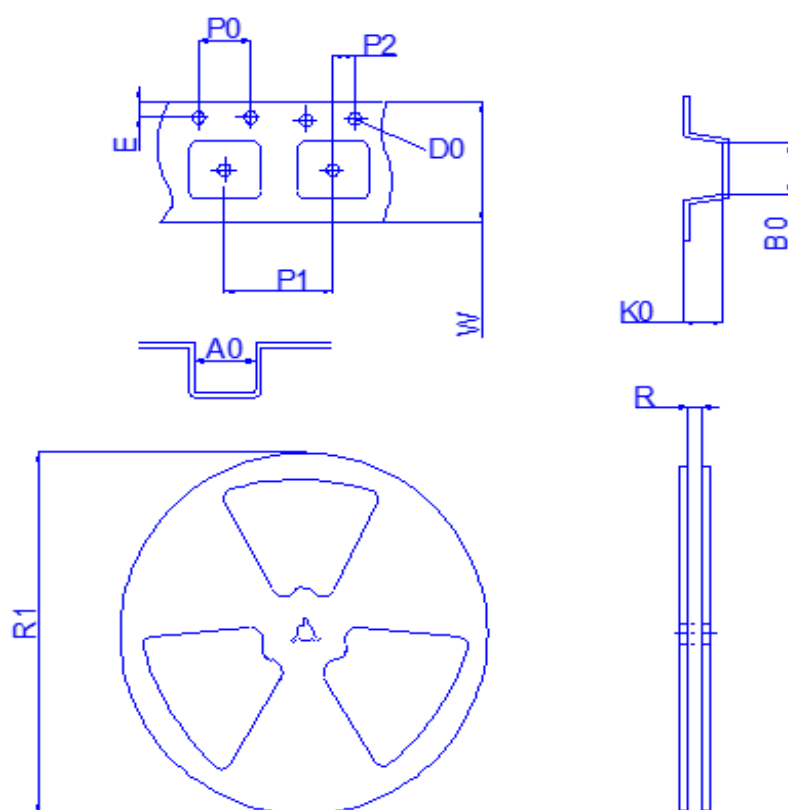


Dimension	A	B	C	D	E	F	G	H	J	K	L	M
Min	4.8	5.55	5.9	0.3	1.17	0.85	0.15	3.61	3.18	1	0.38	0°
Typ.	4.9	5.7	6	0.4	1.27	0.95	0.2	3.87	3.44	1.2	0.4	
Max	5.4	5.85	6.15	0.51	1.37	1.17	0.34	4.31	3.78	1.39	0.71	12°

Footprint



◆ Tape&Reel Information:2500pcs/Reel
(Dimension in millimeter)



Package	EDFN5X6
Reel	13"
Device orientation	FEED DIRECTION

Dimension in mm

Dimension	Carrier tape									Reel	
	A0	B0	D0	E	K0	P0	P1	P2	W	R	R1
Typ.	6.4	5.3	1.5	1.8	1.6	4	8	2	12	12.4	330
±	0.2	0.2	0.1	0.1	0.6	0.1	0.1	0.1	0.3	2	2