

Single N-Channel Logic Level Enhancement Mode Field Effect Transistor

▪Product Summary:

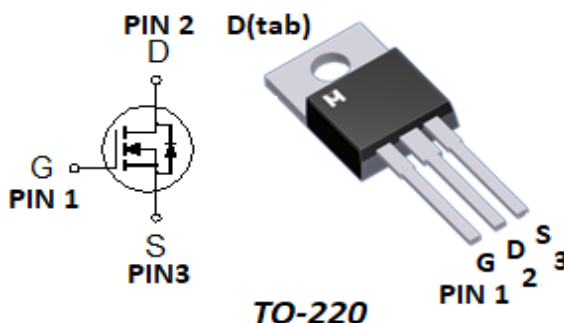
	N-CH
BVDSS	150V
$R_{DS(on) (MAX.) @ V_{GS}=10V}$	11mΩ
$I_D @ T_C=25^{\circ}C$	120A
$I_D @ T_A=25^{\circ}C$	10A

Single N Channel MOSFET

Rg 100% Tested

RoHS & Halogen Free & TSCA Compliant

▪ Pin Description:



▪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	120	A
	$T_C = 100^{\circ}C$		76	
Continuous Drain Current	$T_A = 25^{\circ}C$	I_D	10	
	$T_A = 70^{\circ}C$		8	
Pulsed Drain Current ¹		I_{DM}	400	
Avalanche Current		I_{AS}	50	mJ
Avalanche Energy	$L = 0.1mH$	EAS	125	
Repetitive Avalanche Energy ²	$L = 0.05mH$	EAR	62.5	
Power Dissipation	$T_C = 25^{\circ}C$	P_D	278	W
	$T_C = 100^{\circ}C$		111	
Power Dissipation	$T_A = 25^{\circ}C$	P_D	2.0	W
	$T_A = 70^{\circ}C$		1.3	
Operating Junction & Storage Temperature Range		$T_{j, T_{stg}}$	-55 to 150	$^{\circ}C$

▪THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNIT
Junction-to-Case	$R_{\theta JC}$		0.45	$^{\circ}C/W$
Junction-to-Ambient ³	$R_{\theta JA}$		62.5	

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

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 ($T_J = 25^\circ\text{C}$, 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	150			V
Gate Threshold Voltage ⁴	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	2	3	4	
Gate-Body Leakage ⁴	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current ⁴	I _{DSS}	V _{DS} = 120V, V _{GS} = 0V			1	uA
		V _{DS} =100V, V _{GS} =0V, T _J = 125 °C			25	
On-State Drain Current ¹	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	120			A
Drain-Source On-State Resistance ^{1,4}	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A		8.8	11	mΩ
Forward Transconductance ¹	g _{fs}	V _{DS} = 5V, I _D = 20A		90		S
DYNAMIC						
Input Capacitance ⁵	C _{iss}	V _{GS} = 0V, V _{DS} = 75V, f = 1MHz		4484		pF
Output Capacitance ⁵	C _{oss}			328		
Reverse Transfer Capacitance ⁵	C _{rss}			67		
Gate Resistance ^{4,5}	R _g	f = 1MHz		1.0		Ω
Total Gate Charge ^{1,2,5}	Q _g (V _{GS} =10V)	V _{DS} = 75V, V _{GS} = 10V, I _D = 20A		82.4		nC
	Q _g (V _{GS} =7V)			64.6		
Gate-Source Charge ^{1,2,5}	Q _{gs}			17.7		
Gate-Drain Charge ^{1,2,5}	Q _{gd}			33.4		
Turn-On Delay Time ^{1,2,5}	t _{d(on)}	V _{DS} = 75V, V _{GS} = 10V, I _D = 5A , R _g = 6Ω		23.2		nS
Rise Time ^{1,2,5}	t _r			32.8		
Turn-Off Delay Time ^{1,2,5}	t _{d(off)}			63.5		
Fall Time ^{1,2,5}	t _f			56.8		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I _S				120	A
Pulsed Current ³	I _{SM}				400	
Forward Voltage ^{1,4}	V _{SD}	I _F = I _S , V _{GS} = 0V			1.3	V
Reverse Recovery Time ⁵	t _{rr}	I _F = I _S , dI _F /dt = 100A / uS		94.5		nS
Reverse Recovery Charge ⁵	Q _{rr}			364.9		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.

⁴Guarantee by FT test Item

⁵Guarantee by Engineering test

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



•TYPICAL CHARACTERISTICS

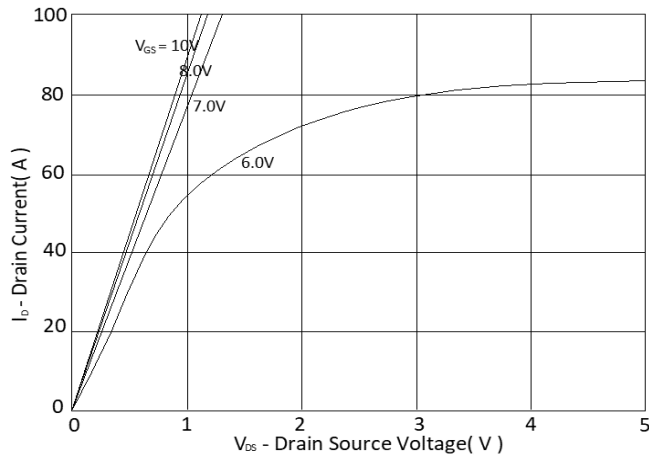


Fig.1 Typical Output Characteristics

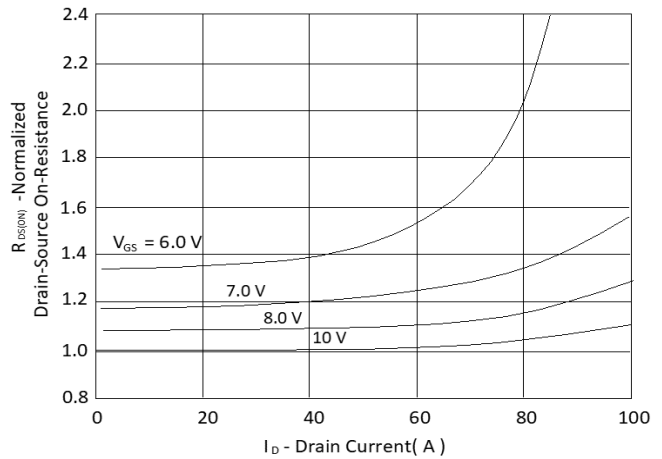


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

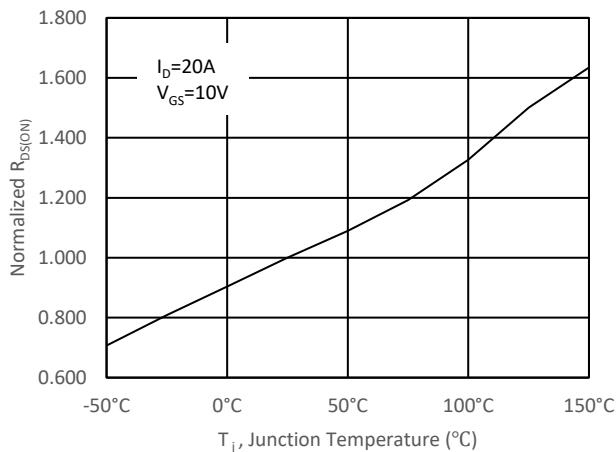


Fig.3 Normalized On-Resistance v.s. Junction Temperature

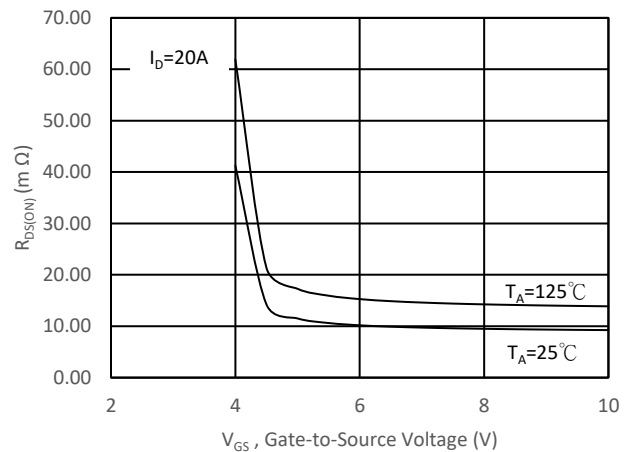


Fig.4 On-Resistance v.s. Gate Voltage

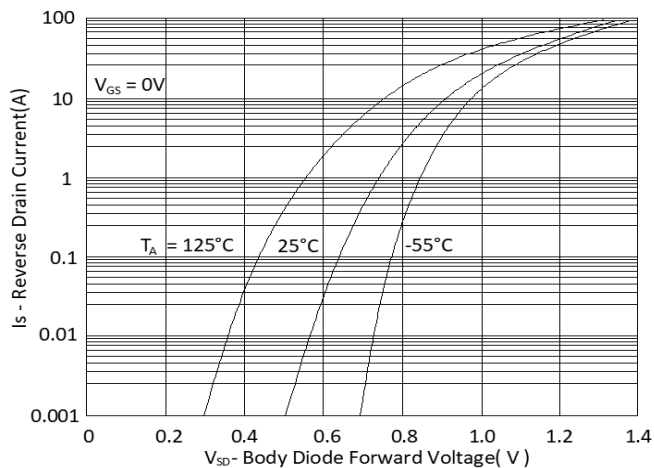


Fig.5 Forward Characteristic of Reverse Diode

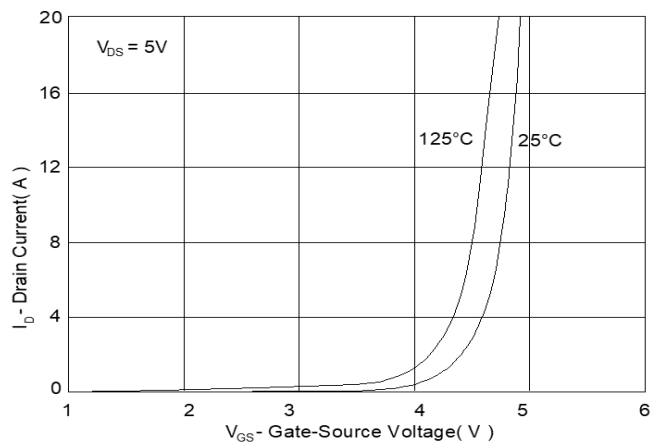


Fig.6 Transfer Characteristics

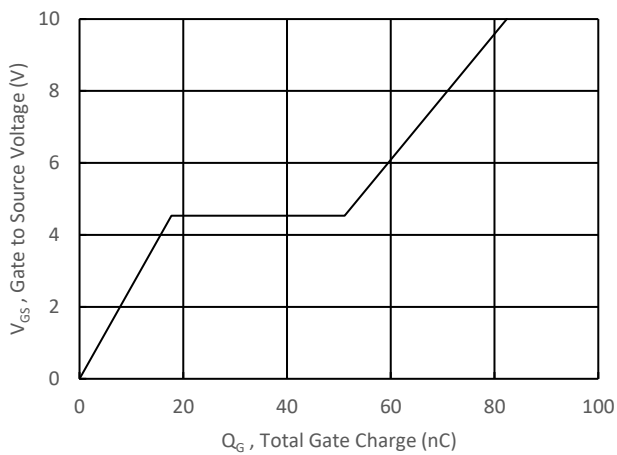


Fig.7 Gate Charge Characteristics

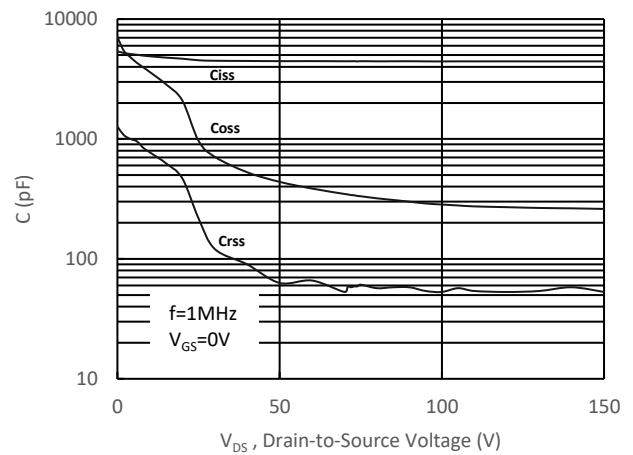


Fig.8 Typical Capacitance Characteristics

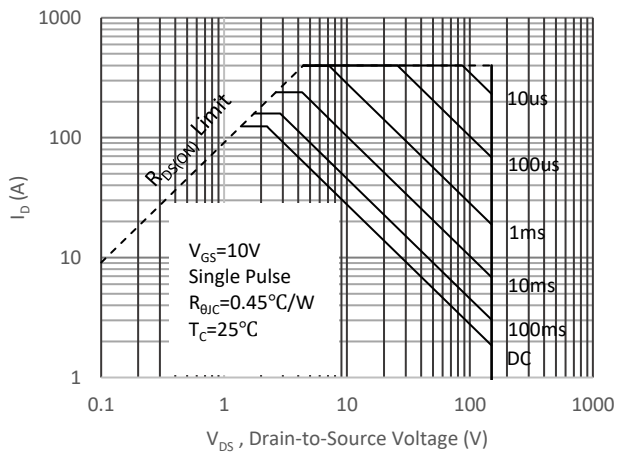


Fig.9. Maximum Safe Operating Area

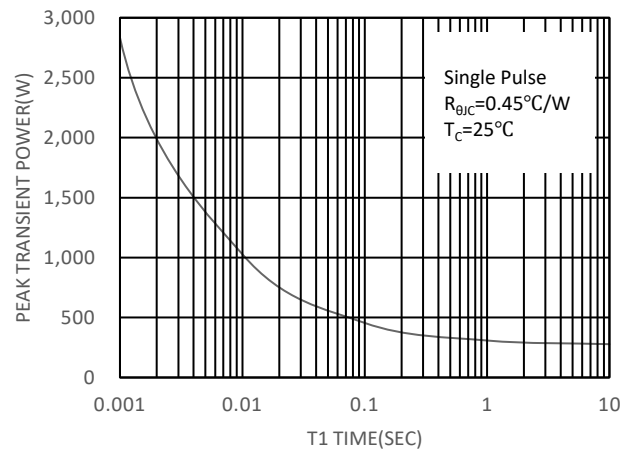


Fig.10. Single Pulse Maximum Power Dissipation

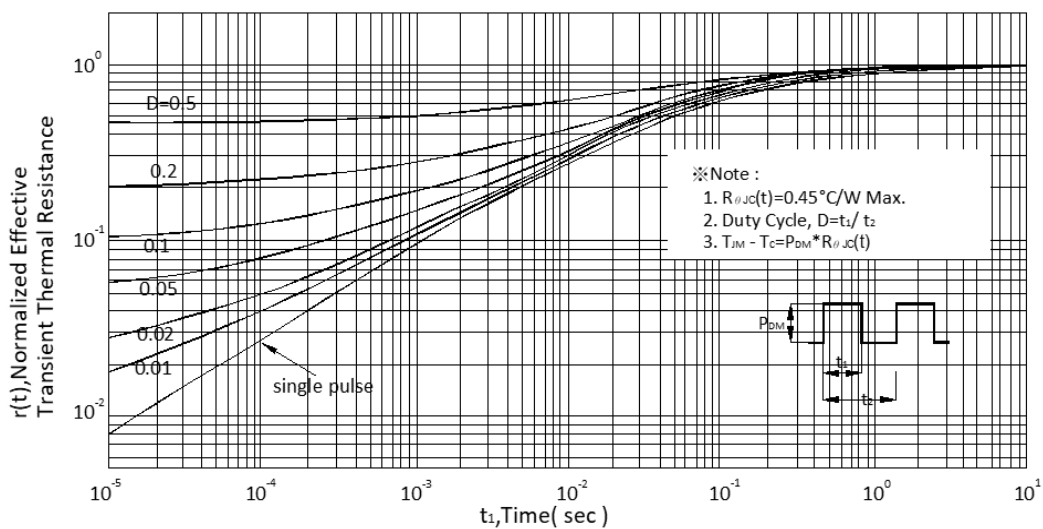
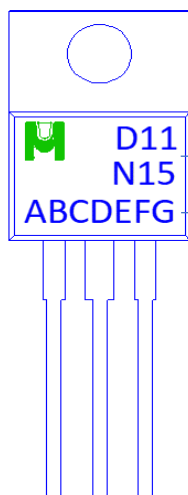


Fig.11. Effective Transient Thermal Impedance

Ordering & Marking Information:

Device Name: EMD11N15E for TO-220



D11N15: Device Name

ABCDEFGH: Date Code

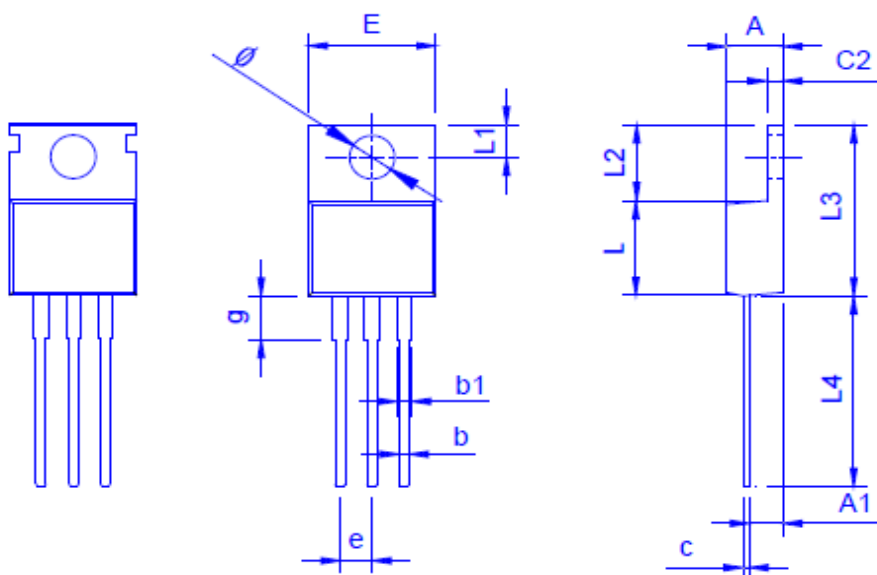
A: Assembly House

B: Year(A:2008 B:2009 C:2010....)

C: Month(A:01 B:02 C:03 D:04 E:05 F:06 G:07 H:08 I:09 J:10 K:11 L:12)

DEFG: Serial No.

Outline Drawing



Dimension	A	A1	b	b1	c	c2	E	L	L1	L2	L3	L4	Ø
Min.	4.240	2.250	0.700	1.170	0.310	1.150	9.910	8.500	2.590	6.100	14.700	12.700	3.400
Typ.	4.440	2.400	0.800	1.550	0.500	1.270	10.160	8.920	2.800	6.300	15.370	13.720	3.840
Max.	4.700	2.820	0.910	1.750	0.650	1.400	10.360	9.750	3.250	6.800	16.900	13.970	3.935

Dimension	e	g
Min.	2.440	2.850
Typ.	2.540	3.800
Max.	2.640	4.000

◆ Tube Information : 50pcs/Tube (1000pcs/Box)

