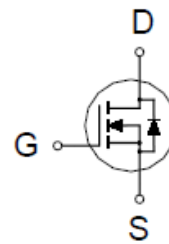


# P0903BEA

## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
30V	9mΩ @ $V_{GS} = 10V$	48A



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	±20	
Continuous Drain Current <sup>2</sup>	$T_C = 25\text{ °C}$	$I_D$	48	A
	$T_C = 100\text{ °C}$		30	
	$T_A = 25\text{ °C}$		13	
	$T_A = 70\text{ °C}$		10	
Pulsed Drain Current <sup>1</sup>		$I_{DM}$	130	
Avalanche Current		$I_{AS}$	30	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	45	mJ
Power Dissipation	$T_C = 25\text{ °C}$	$P_D$	33	W
	$T_C = 100\text{ °C}$		13	
	$T_A = 25\text{ °C}$		2.3	
	$T_A = 70\text{ °C}$		1.5	
Operating Junction & Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	°C

# P0903BEA

## N-Channel Enhancement Mode MOSFET

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient <sup>3</sup>	$R_{\theta JA}$		55	°C / W
Junction-to-Case	$R_{\theta JC}$		3.7	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Package limitation current is 30A.

<sup>3</sup>The 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  $T_A=25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design

### ELECTRICAL CHARACTERISTICS ( $T_J = 25^{\circ}\text{C}$ , Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.7	3	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24V, V_{GS} = 0V$			1	$\mu A$
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 55^{\circ}\text{C}$			10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	130			A
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 10A$		11.2	13	m $\Omega$
		$V_{GS} = 10V, I_D = 13A$		7	9	
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = 5V, I_D = 13A$		45		S
<b>DYNAMIC</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 15V, f = 1\text{MHz}$		1590		pF
Output Capacitance	$C_{oss}$			193		
Reverse Transfer Capacitance	$C_{rss}$			159		
Total Gate Charge <sup>2</sup>	$Q_{g(VGS=10V)}$	$V_{DS} = 0.5V_{(BR)DSS}, I_D = 13A, V_{GS}=10V$		31		nC
	$Q_{g(VGS=4.5V)}$			17		
Gate-Source Charge <sup>2</sup>	$Q_{gs}$			5.5		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$			8		
Gate Resistance	$R_g$		$V_{GS} = 0V, V_{DS} = 0V, f = 1\text{MHz}$		1.7	
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DS} = 0.5V_{(BR)DSS}, I_D \cong 13A, V_{GS} = 10V, R_{GEN} = 3\Omega$		9		nS
Rise Time <sup>2</sup>	$t_r$			14		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$			32		
Fall Time <sup>2</sup>	$t_f$			16		

## **P0903BEA**

### **N-Channel Enhancement Mode MOSFET**

#### **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Continuous Current <sup>3</sup>	$I_S$			48	A
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = 13A, V_{GS} = 0V$		1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = 13A, di_F/dt = 100A / \mu S$		11.7	nS
Reverse Recovery Charge	$Q_{rr}$			2	nC

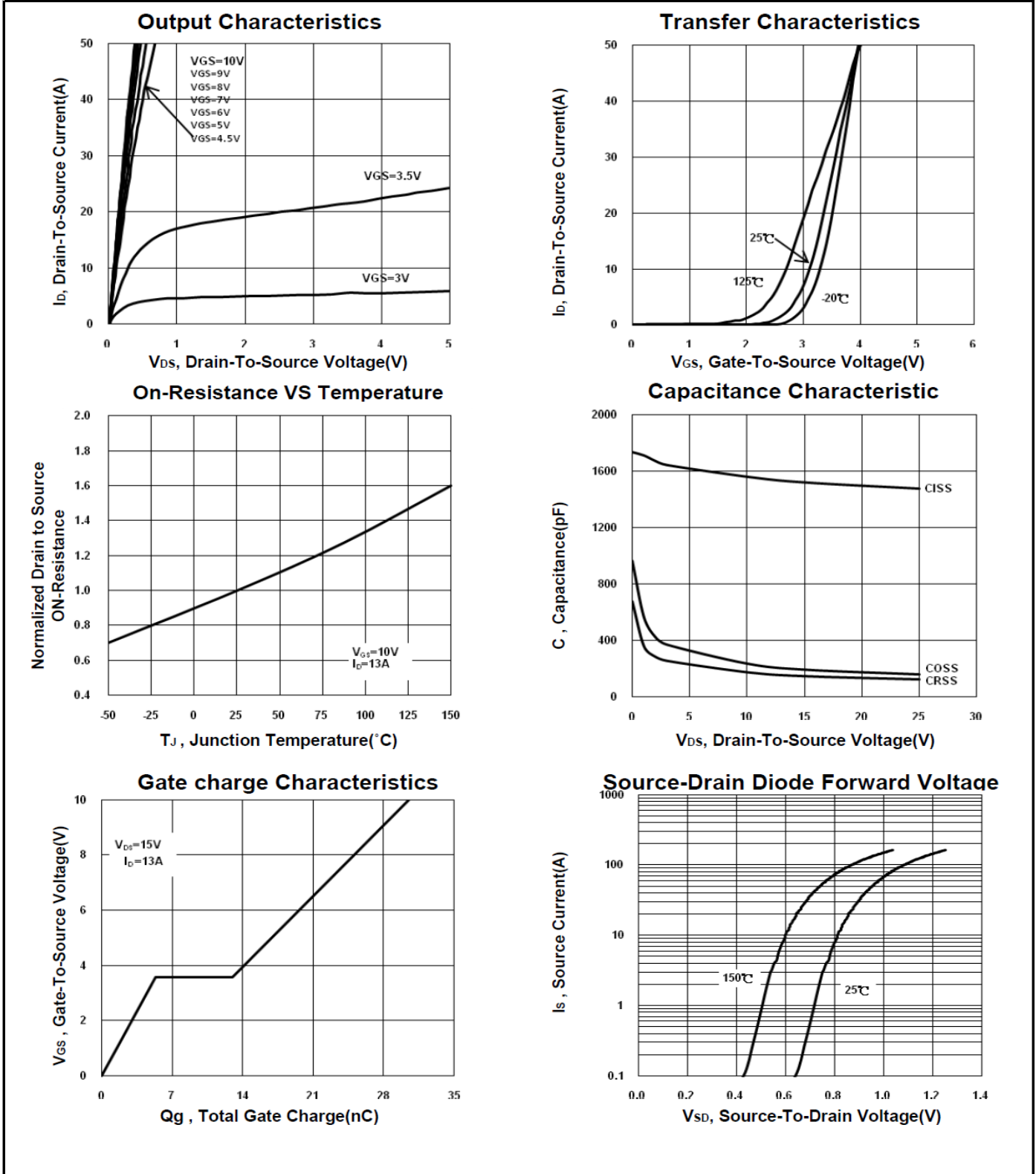
<sup>1</sup>Pulse test : Pulse Width  $\leq 300 \mu\text{sec}$ , Duty Cycle  $\leq 2\%$ .

<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Package limitation current is 30A.

# P0903BEA

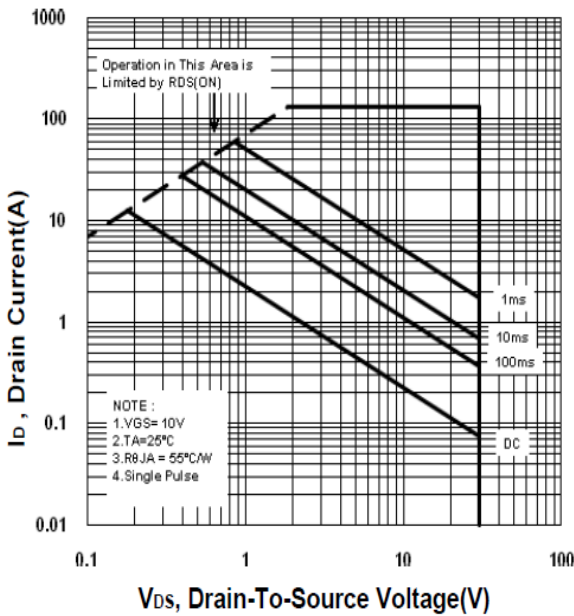
## N-Channel Enhancement Mode MOSFET



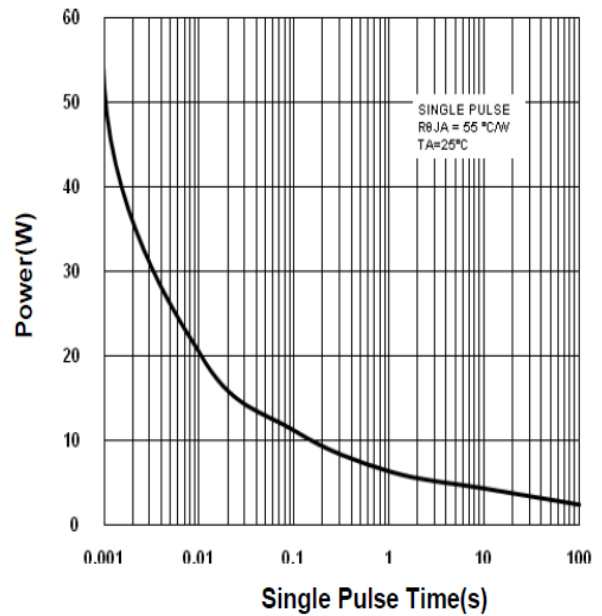
# P0903BEA

## N-Channel Enhancement Mode MOSFET

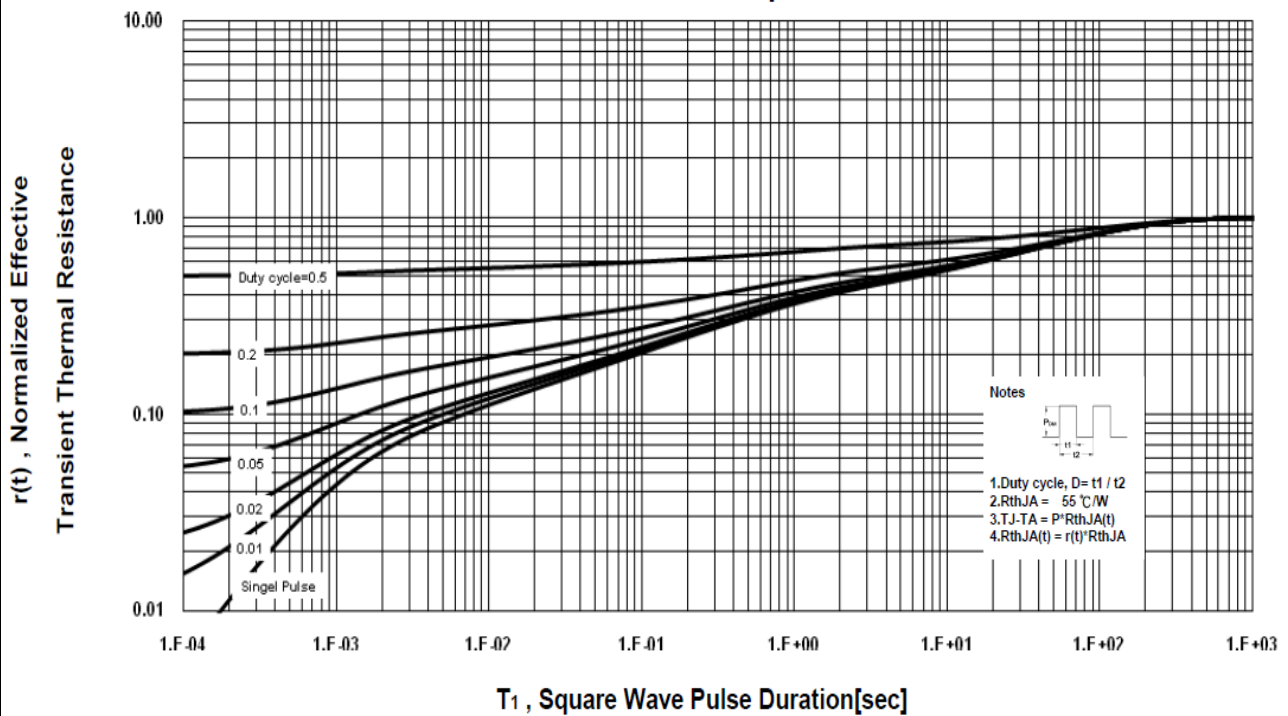
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



# P0903BEA

## N-Channel Enhancement Mode MOSFET

### Package Dimension

### PDFN 3x3P MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	3		3.6	I	0.7		1.12
B	2.88		3.2	J	0.1		0.33
C	2.9		3.2	K	0.6		
D	1.98		2.69	L	0°	10°	12°
E	3		3.6	M	0.14		0.41
F	0		0.455	N	0.6		0.7
G	1.47		2.2	O	0.12		0.36
H	0.15		0.56	P	0		0.2

