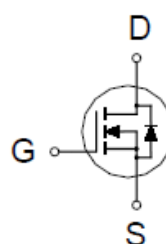


P0903BEA

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 ²	$T_C = 25\text{ °C}$	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 ¹		I_{DM}	130	
Avalanche Current		I_{AS}	30	
Avalanche Energy	$L = 0.1mH$	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 ³	$R_{\theta JA}$		55	°C / W
Junction-to-Case	$R_{\theta JC}$		3.7	

¹Pulse width limited by maximum junction temperature.

²Package limitation current is 30A.

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 $T_A=25^{\circ}\text{C}$. 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	
STATIC						
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}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24V, V_{GS} = 0V$			1	μA
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 55\text{ }^{\circ}C$			10	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	130			A
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 10A$		11.2	13	mΩ
		$V_{GS} = 10V, I_D = 13A$		7	9	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 5V, I_D = 13A$		45		S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$		1590		pF
Output Capacitance	C_{oss}			193		
Reverse Transfer Capacitance	C_{rss}			159		
Total Gate Charge ²	$Q_{g(VGS=10V)}$	$V_{DS} = 0.5V_{(BR)DSS}, I_D = 13A, V_{GS}=10V$		31		nC
	$Q_{g(VGS=4.5V)}$			17		
Gate-Source Charge ²	Q_{gs}			5.5		
Gate-Drain Charge ²	Q_{gd}			8		
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		1.7		Ω
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DS} = 0.5V_{(BR)DSS}, I_D \cong 13A, V_{GS} = 10V, R_{GEN} = 3\Omega$		9		nS
Rise Time ²	t_r			14		
Turn-Off Delay Time ²	$t_{d(off)}$			32		
Fall Time ²	t_f			16		

P0903BEA

N-Channel Enhancement Mode MOSFET

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Continuous Current ³	I_S			48	A
Forward Voltage ¹	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

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

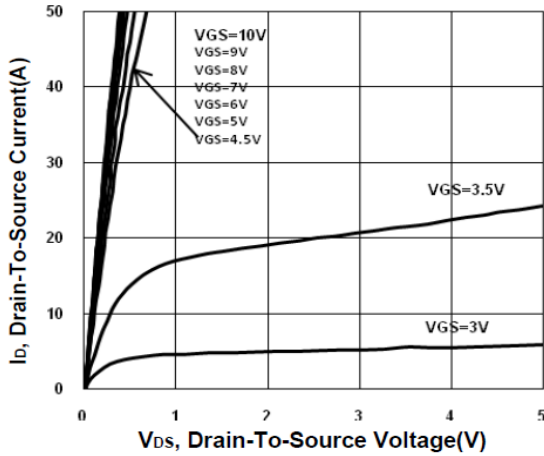
²Independent of operating temperature.

³Package limitation current is 30A.

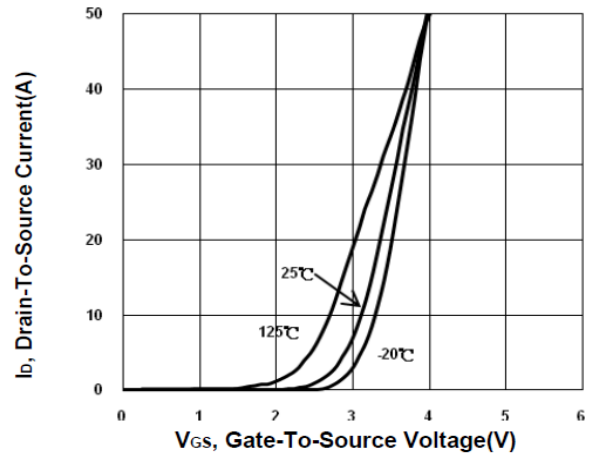
P0903BEA

N-Channel Enhancement Mode MOSFET

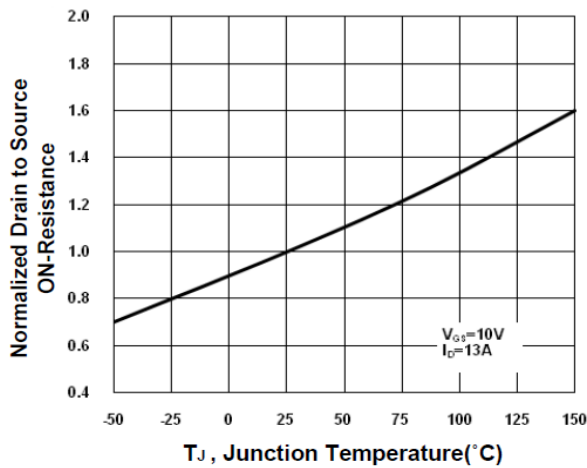
Output Characteristics



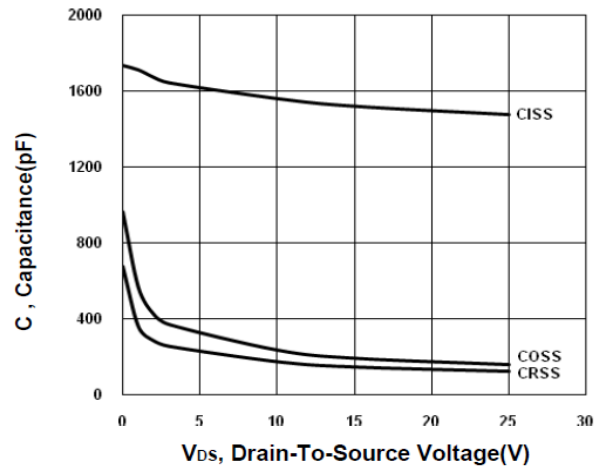
Transfer Characteristics



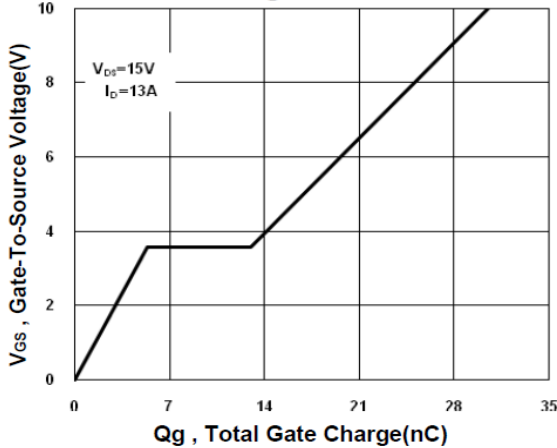
On-Resistance VS Temperature



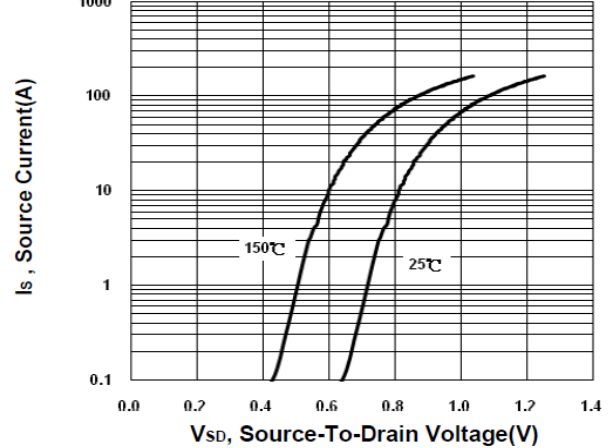
Capacitance Characteristic



Gate charge Characteristics



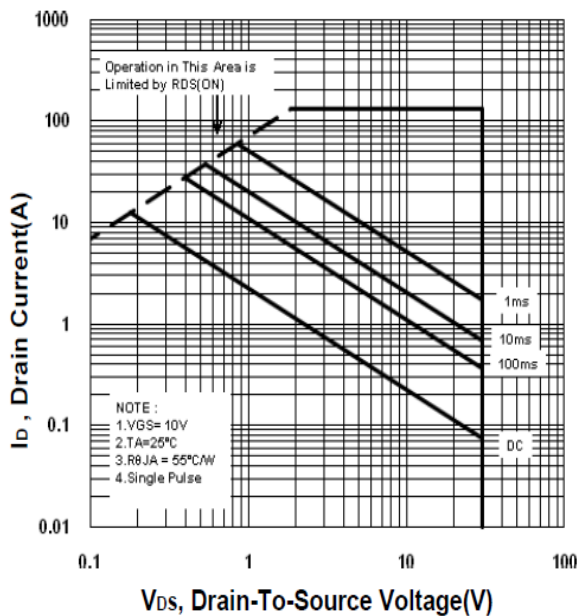
Source-Drain Diode Forward Voltage



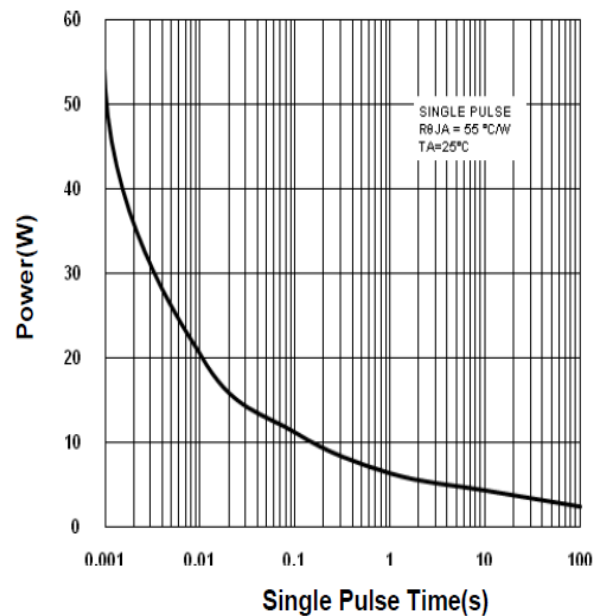
P0903BEA

N-Channel Enhancement Mode MOSFET

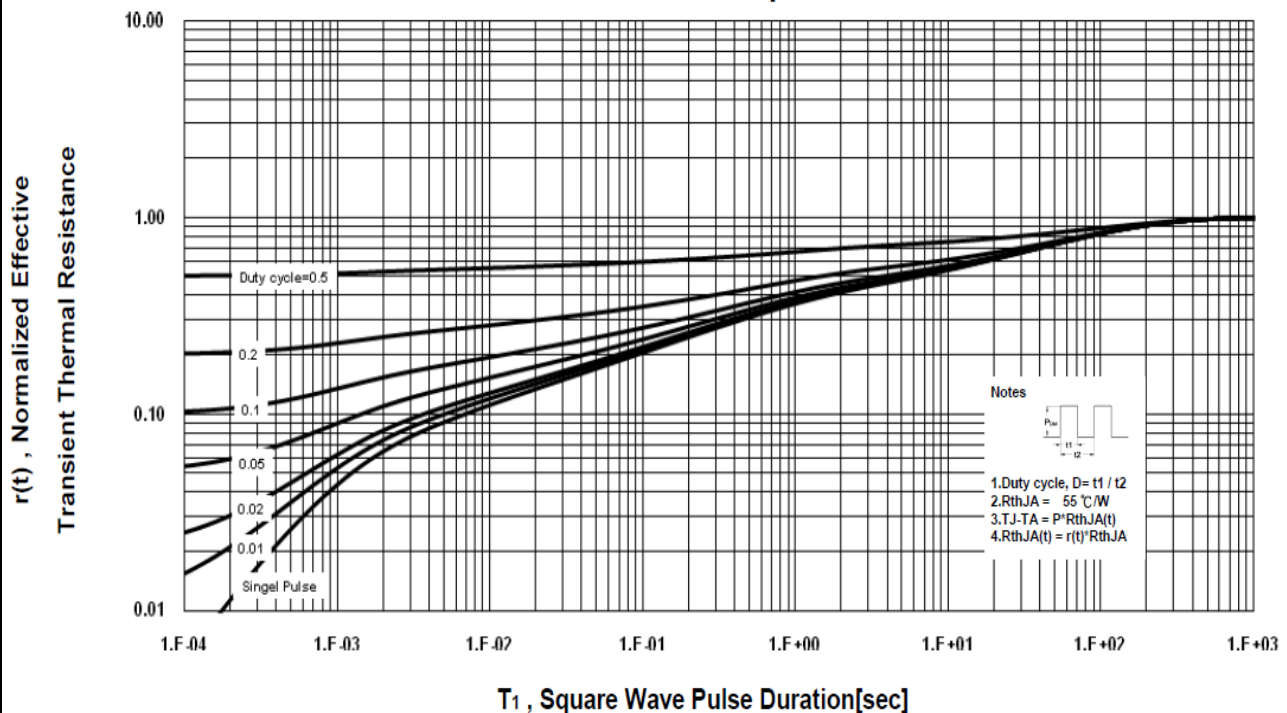
Safe Operating Area



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

