

PB210BI

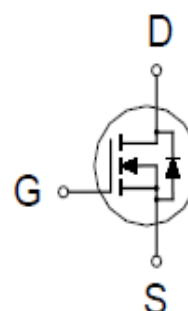
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	230m Ω @ $V_{GS} = 10V$	9A



TO-251



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ²	$T_C = 25\text{ }^{\circ}\text{C}$	I_D	9	A
	$T_C = 100\text{ }^{\circ}\text{C}$		6	
Pulsed Drain Current ^{1,2}		I_{DM}	14	
Avalanche Current		I_{AS}	16	
Avalanche Energy	$L = 0.1\text{ mH}$	E_{AS}	14	mJ
Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	P_D	36	W
	$T_C = 100\text{ }^{\circ}\text{C}$		14	
Operating Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3.5	$^{\circ}\text{C} / \text{W}$

¹Pulse width limited by maximum junction temperature.

²Limited only by maximum temperature allowed.

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

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.4	2	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$			1	μA
		$V_{DS} = 80V, V_{GS} = 0V, T_J = 70^{\circ}C$			10	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 5V$	14			A
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 5V, I_D = 6A$		213	240	mΩ
		$V_{GS} = 10V, I_D = 6A$		204	230	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 5V, I_D = 6A$		15		S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		647		pF
Output Capacitance	C_{oss}			46		
Reverse Transfer Capacitance	C_{rss}			35		
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		1.8		Ω
Total Gate Charge ²	Q_g	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V, I_D = 6A$		15.6		nC
Gate-Source Charge ²	Q_{gs}			2		
Gate-Drain Charge ²	Q_{gd}			5		
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DS} = 0.5V_{(BR)DSS}, I_D \cong 6A, V_{GS} = 10V, R_{GEN} = 6\Omega$		20		nS
Rise Time ²	t_r			20		
Turn-Off Delay Time ²	$t_{d(off)}$			27		
Fall Time ²	t_f			16		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T _J = 25 °C)						
Continuous Current	I_S				9	A
Forward Voltage ¹	V_{SD}	$I_F = 6A, V_{GS} = 0V$			1.4	V
Reverse Recovery Time	t_{rr}	$I_F = 6A, di_F/dt = 100A / \mu S$		40		nS
Reverse Recovery Charge	Q_{rr}			53		nC

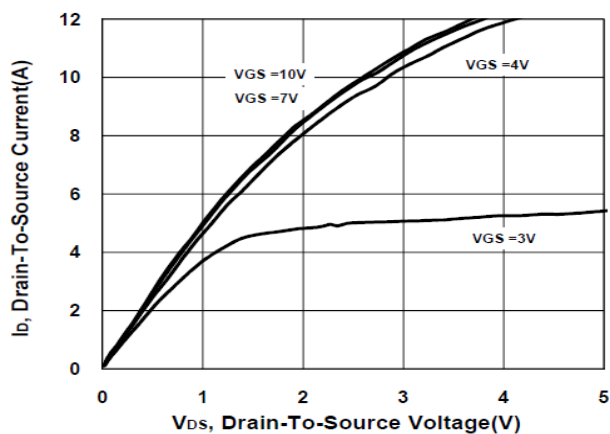
¹Pulse test : Pulse Width $\leq 300 \mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

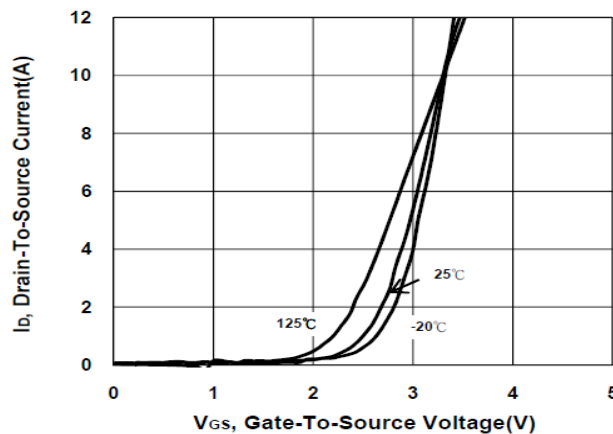
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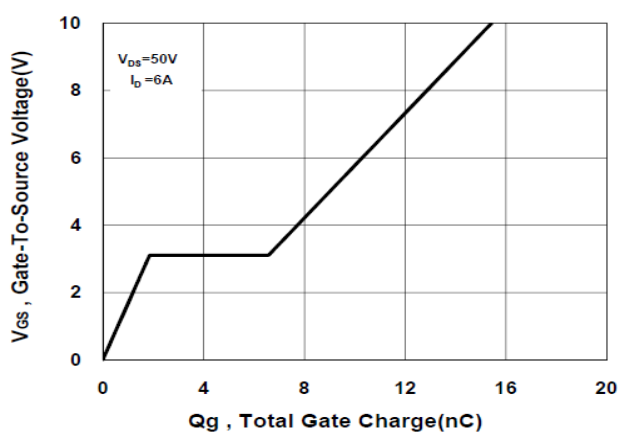
Output Characteristics



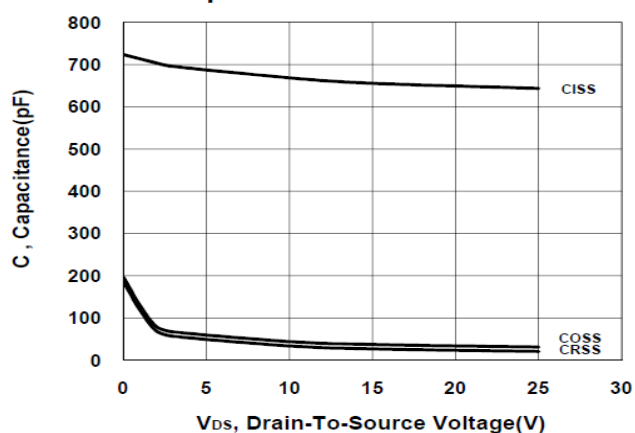
Transfer Characteristics



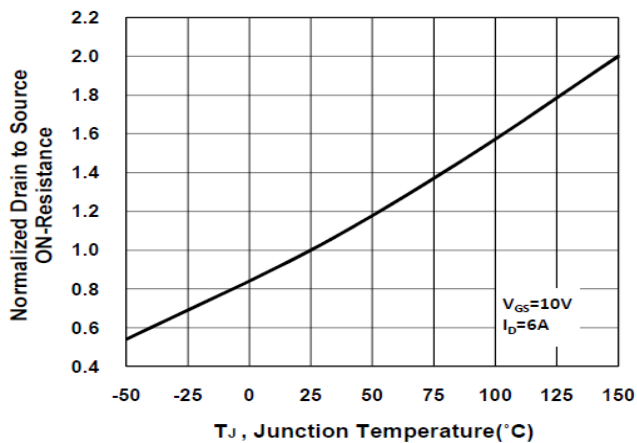
Gate charge Characteristics



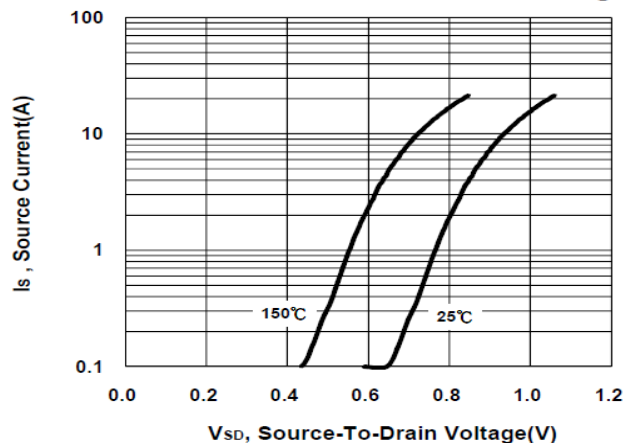
Capacitance Characteristic



On-Resistance VS Gate-To-Source



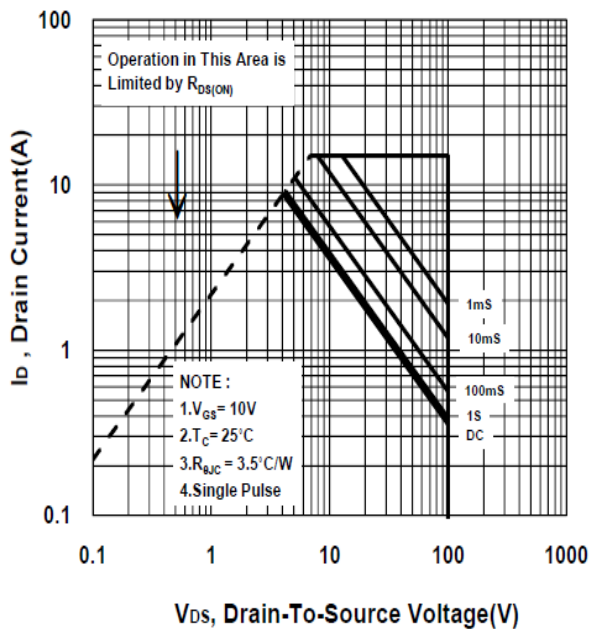
Source-Drain Diode Forward Voltage



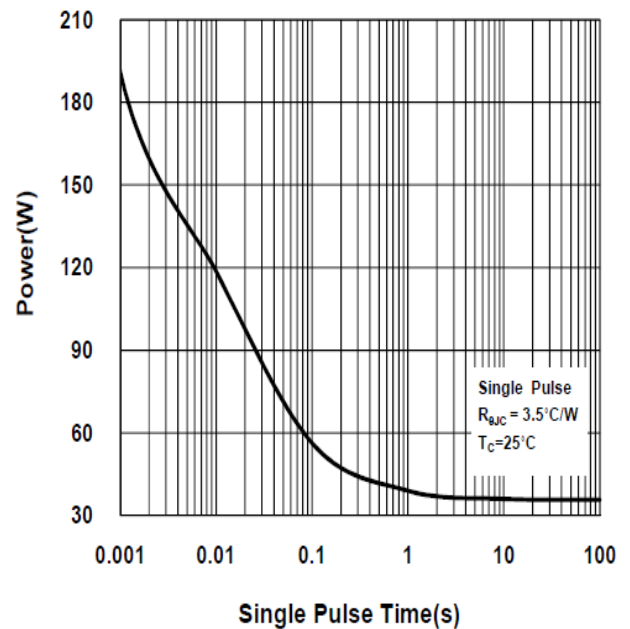
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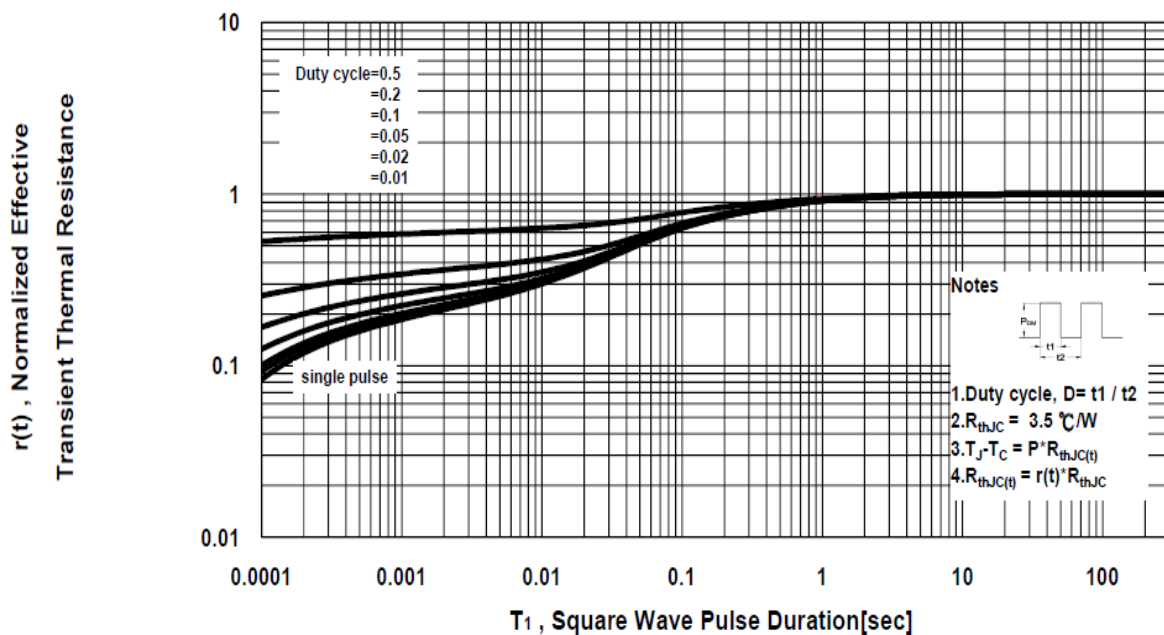
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

TO-251 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	14	15	17.14	H	0.89		1.7
B	2.1	2.3	2.5	I	6.3		6.8
C	0.4	0.5	0.6	J	4.8		5.5
D	0.35	0.5	0.65	K	0.5	0.84	1.14
E	0.9	1.1	1.5	L	0.4	0.76	0.912
F	7		9.65	M		2.3	
G	5.3		6.22	N	1.4	2.16	2.23

