UNIKC Semiconductor

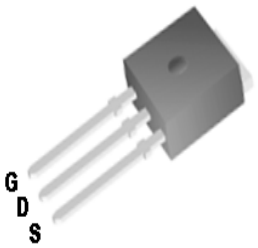
RoHS Compliant

PB210BI

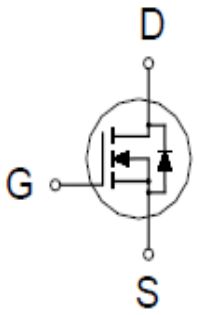
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

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



TO-251



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °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 °C	I_D	9	A
	T_C = 100 °C		6	
Pulsed Drain Current[1,2]		I_{DM}	14	
Avalanche Current		I_{AS}	16	
Avalanche Energy	L = 0.1 mH	E_{AS}	14	mJ
Power Dissipation	T_C = 25 °C	P_D	36	W
	T_C = 100 °C		14	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

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

[1]Pulse width limited by maximum junction temperature.

[2]Limited only by maximum temperature allowed.

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ELECTRICAL CHARACTERISTICS (T_J = 25 °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 = 250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.4	2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±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°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} = 0.5$V_{(BR)DSS}$, 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} = 0.5$V_{(BR)DSS}$, $I_D \cong$ 6A, V_{GS} = 10V, R_{GEN} =6Ω		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 / μS		40		nS
Reverse Recovery Charge	Q_{rr}			53		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

[2]Independent of operating temperature.

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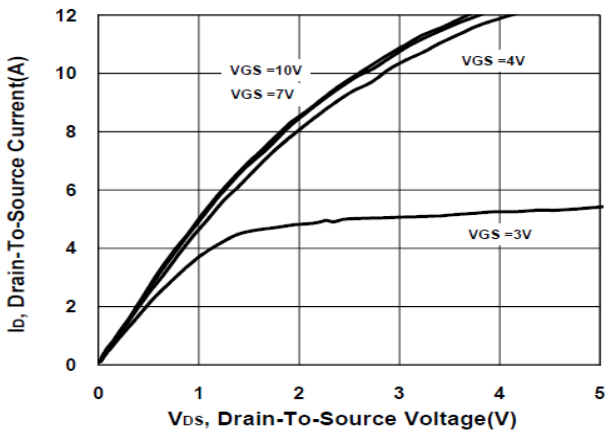
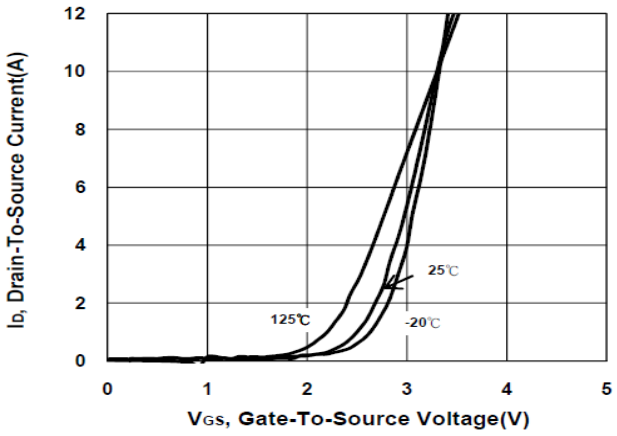
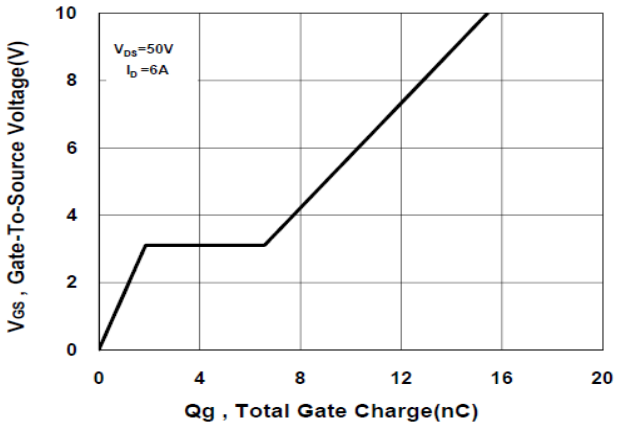
Output Characteristics



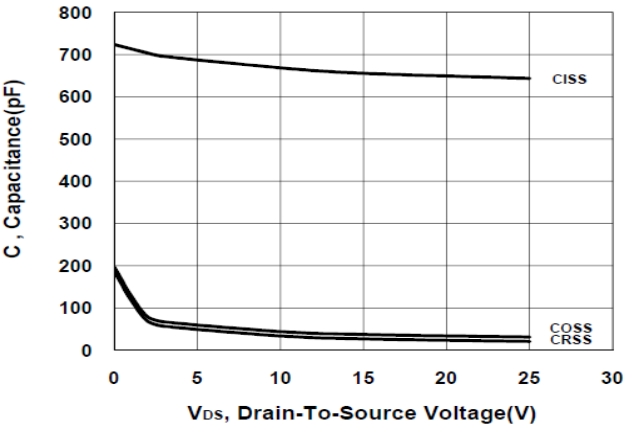
Transfer Characteristics



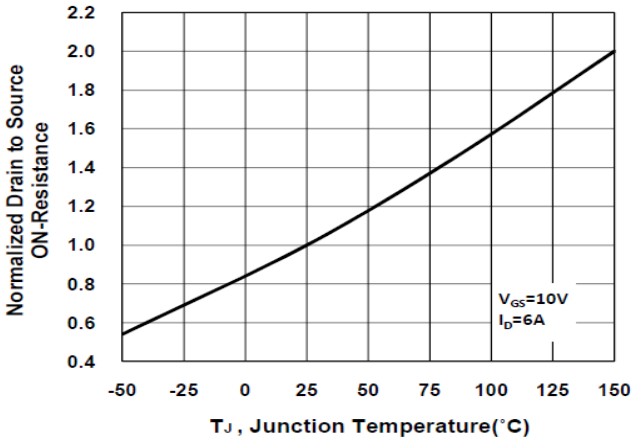
Gate charge Characteristics



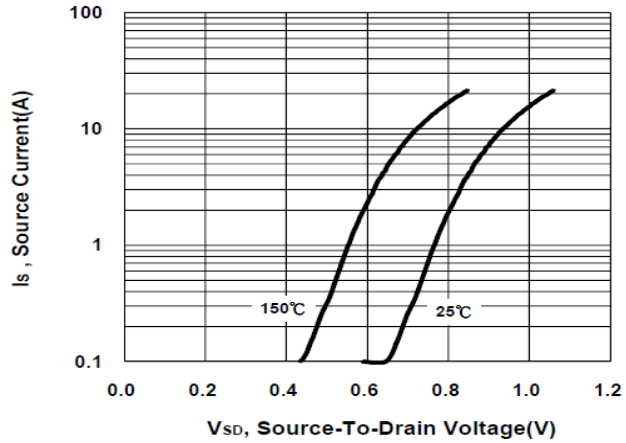
Capacitance Characteristic



On-Resistance VS Gate-To-Source



Source-Drain Diode Forward Voltage



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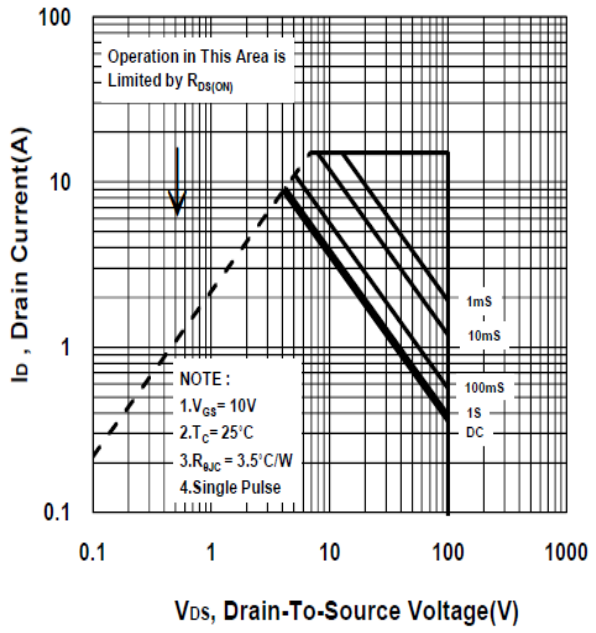
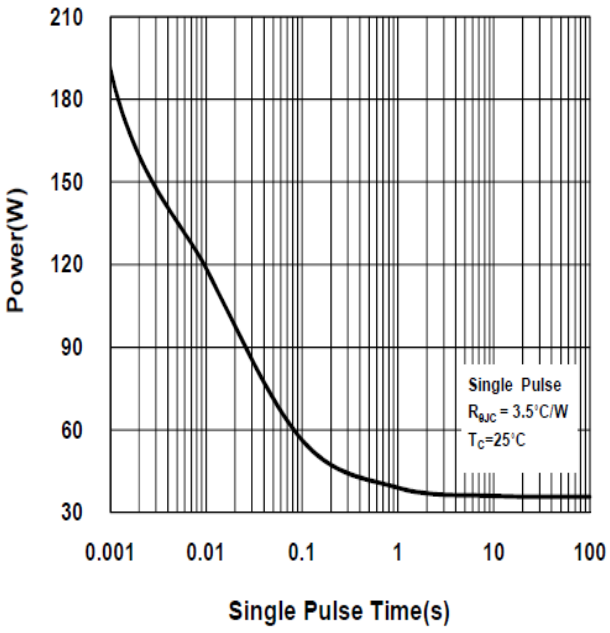
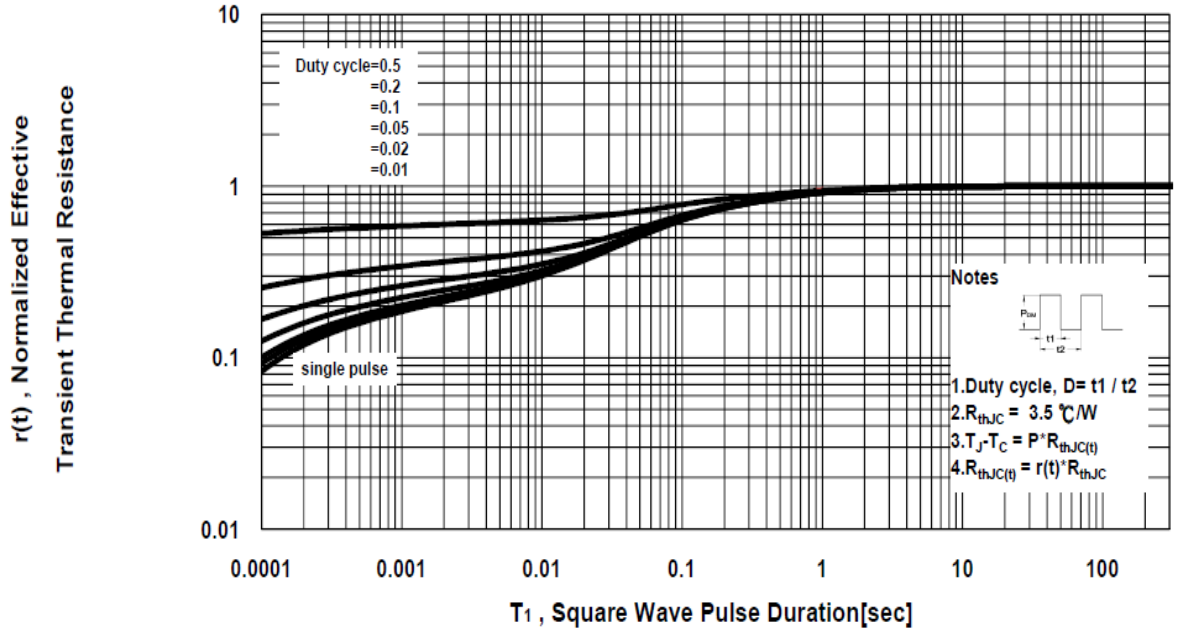
Safe Operating Area



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

