

P2804BI

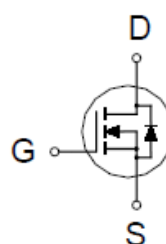
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	28mΩ @ $V_{GS} = 10V$	33A



TO-251



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25\text{ °C}$	I_D	33	A
	$T_C = 100\text{ °C}$		20	
Pulsed Drain Current ¹		I_{DM}	120	
Avalanche Current		I_{AS}	22	
Avalanche Energy	$L = 0.1mH$	E_{AS}	26	mJ
Power Dissipation	$T_C = 25\text{ °C}$	P_D	48	W
	$T_C = 100\text{ °C}$		19	
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	$R_{\theta JC}$		2.6	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

¹Pulse width limited by maximum junction temperature.

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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	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	2	3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32V, V _{GS} = 0V			1	μA
		V _{DS} = 30V, V _{GS} = 0V , T _J = 125 °C			10	
On-State Drain Current ¹	I _{D(ON)}	V _{DS} = 10V, V _{GS} = 10V	120			A
Drain-Source On-State Resistance ¹	R _{DS(ON)}	V _{GS} = 5V, I _D = 12A		27	42	mΩ
		V _{GS} = 10V, I _D = 18A		14	28	
Forward Transconductance ¹	g _{fs}	V _{DS} = 10V, I _D = 18A		22		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz		824		pF
Output Capacitance	C _{oss}			170		
Reverse Transfer Capacitance	C _{rss}			108		
Total Gate Charge ²	Q _g	V _{DS} = 20V, V _{GS} = 10V, I _D = 18A		18		nC
Gate-Source Charge ²	Q _{gs}			3.5		
Gate-Drain Charge ²	Q _{gd}			6.5		
Gate Resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz		1.4		Ω
Turn-On Delay Time ²	t _{d(on)}	V _{DD} = 20V, I _D ≅ 18A, V _{GS} = 10V, R _{GEN} = 6Ω		21		nS
Rise Time ²	t _r			89		
Turn-Off Delay Time ²	t _{d(off)}			18		
Fall Time ²	t _f			30		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T _J = 25 °C)						
Continuous Current	I _S				33	A
Forward Voltage ¹	V _{SD}	I _F = 18A, V _{GS} = 0V			1.3	V
Reverse Recovery Time	t _{rr}	I _F = 18A, dI/dt = 100A / μS		22		nS
Reverse Recovery Charge	Q _{rr}			15		nC

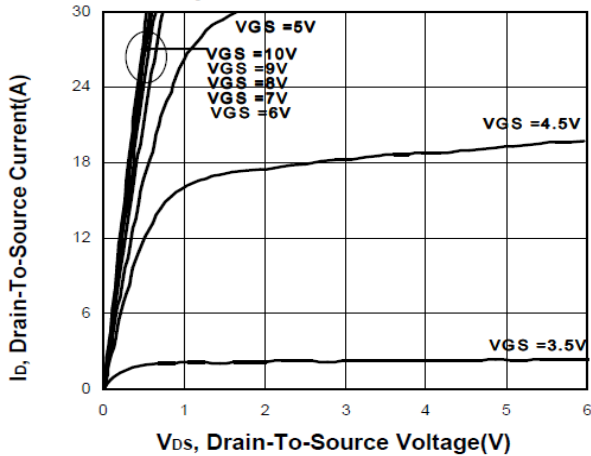
¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

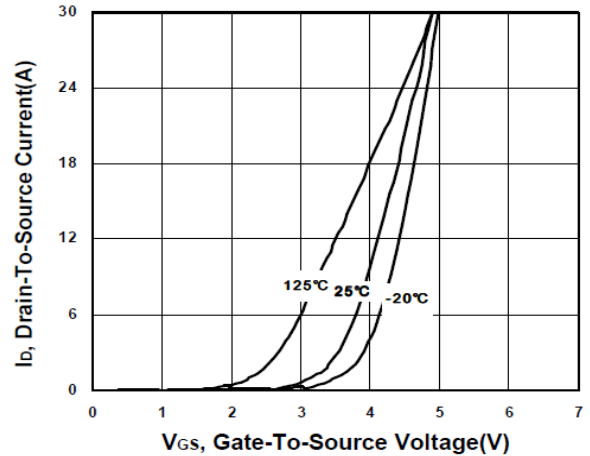
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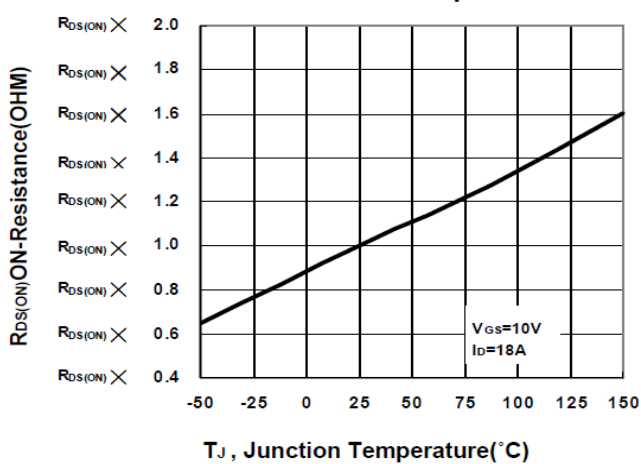
Output Characteristics



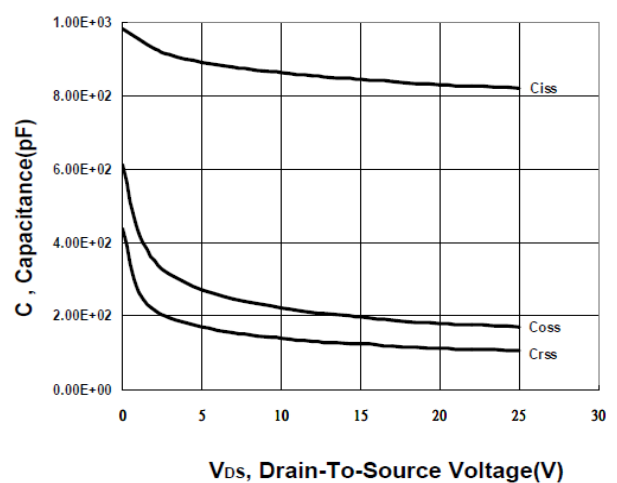
Transfer Characteristics



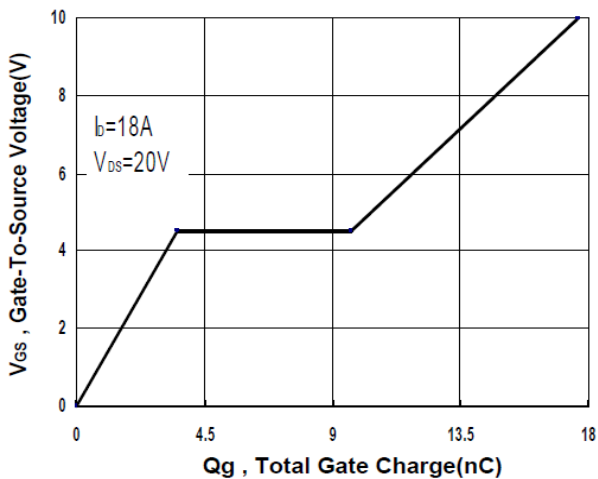
On-Resistance VS Temperature



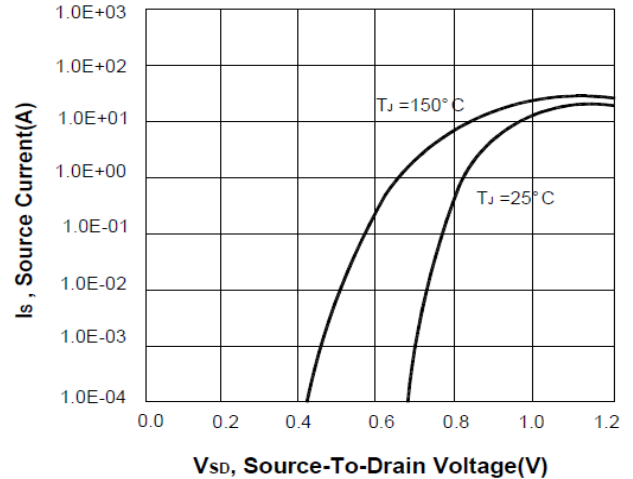
Capacitance Characteristic



Gate charge Characteristics



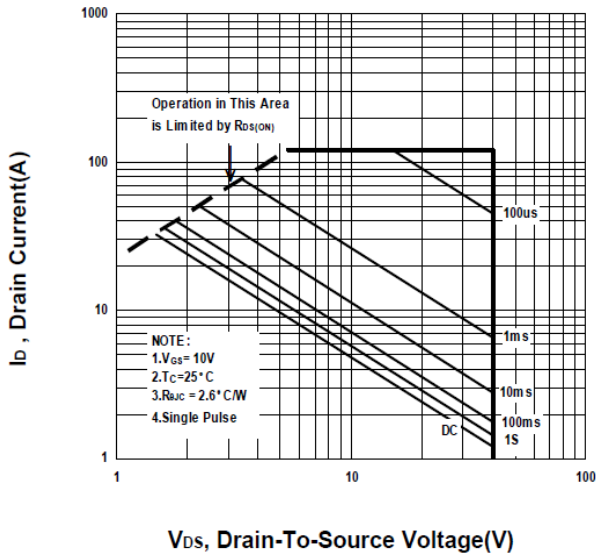
Source-Drain Diode Forward Voltage



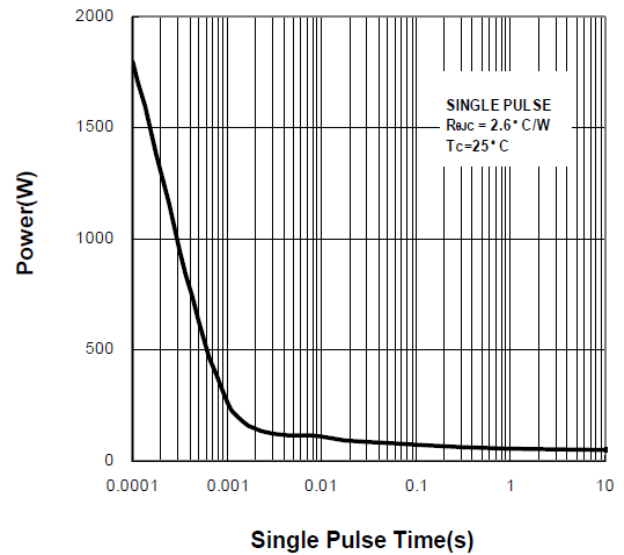
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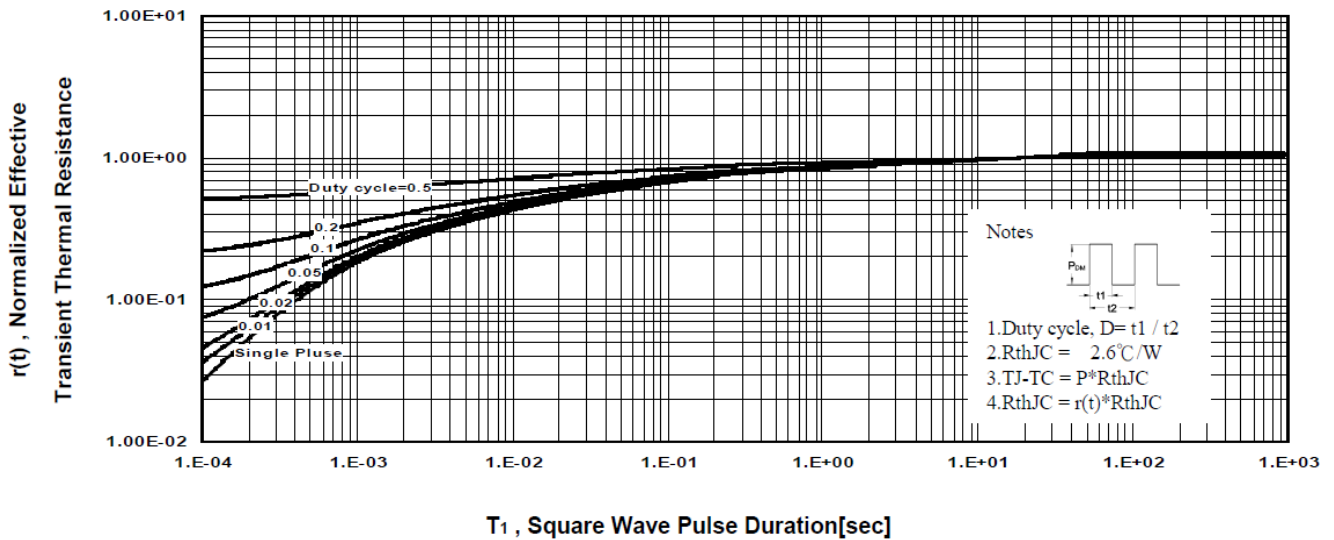
Safe Operating Area



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

