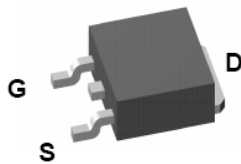


P1004BD

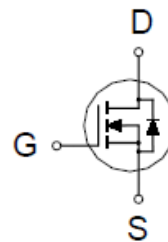
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	10m Ω @ $V_{GS} = 10V$	55A



TO-252



100% Rg tested
100% UIS tested

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	I_D	55	A
	$T_C = 100\text{ }^\circ\text{C}$		44	
Pulsed Drain Current ¹		I_{DM}	120	
Avalanche Current		I_{AS}	38	
Avalanche Energy ²	$L = 0.1\text{mH}$	E_{AS}	73	mJ
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	50	W
	$T_C = 70\text{ }^\circ\text{C}$		32	
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	$R_{\theta JC}$		2.5	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		62.5	

¹Pulse width limited by maximum junction temperature.

² $V_{DD} = 20V$, Starting $T_J = 25\text{ }^\circ\text{C}$.

P1004BD

N-Channel Enhancement Mode MOSFET

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

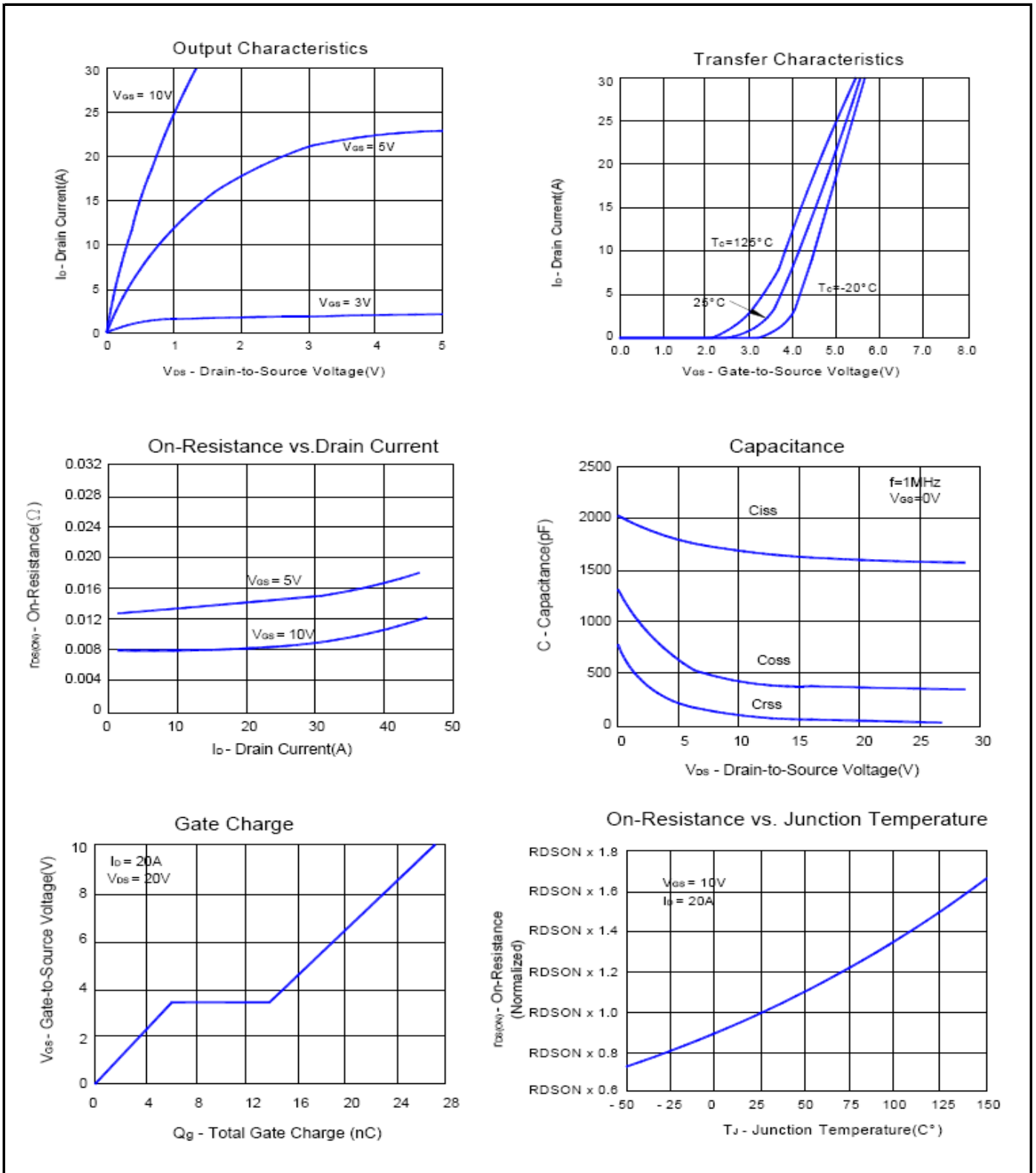
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.7	2.0	3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 32V, V _{GS} = 0V			1	μA
		V _{DS} = 30V, V _{GS} = 0V, T _J = 55 °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 = 8A		13	17	mΩ
		V _{GS} = 10V, I _D = 15A		8	10	
Forward Transconductance ¹	g _{fs}	V _{DS} = 10V, I _D = 20A		25		S
DYNAMIC						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz		1550	1750	pF
Output Capacitance	C _{oss}			280	310	
Reverse Transfer Capacitance	C _{rss}			185	200	
Gate Resistance	R _g	V _{GS} = 15mV, V _{DS} = 0V, f = 1MHz		1.5	2.5	Ω
Total Gate Charge ²	Q _g	V _{DS} = 0.5V _{(BR)DSS} , V _{GS} = 10V, I _D = 20A		26	32	nC
Gate-Source Charge ²	Q _{gs}			6	8.5	
Gate-Drain Charge ²	Q _{gd}			8	10	
Turn-On Delay Time ²	t _{d(on)}	V _{DS} = 20V, R _L = 1Ω I _D ≅ 20A, V _{GS} = 10V, R _{GEN} = 6Ω		12	33	nS
Rise Time ²	t _r			35	65	
Turn-Off Delay Time ²	t _{d(off)}			37		
Fall Time ²	t _f			12	23	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I _S				38	A
Forward Voltage ¹	V _{SD}	I _F = 15A, V _{GS} = 0V		0.7	1.3	V
Reverse Recovery Time	t _{rr}	I _F = 20A, dI _F /dt = 100A / μS		75		nS
Reverse Recovery Charge	Q _{rr}				55	

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

²Independent of operating temperature.

P1004BD

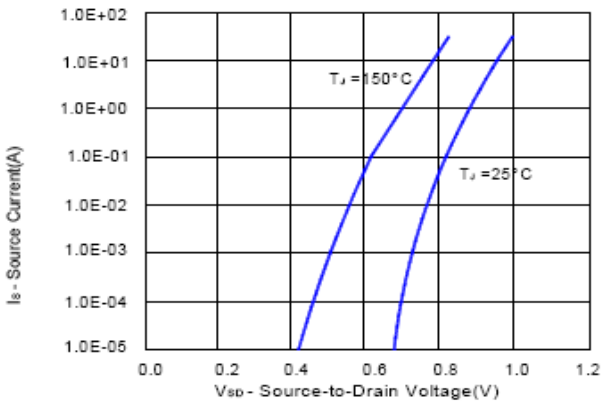
N-Channel Enhancement Mode MOSFET



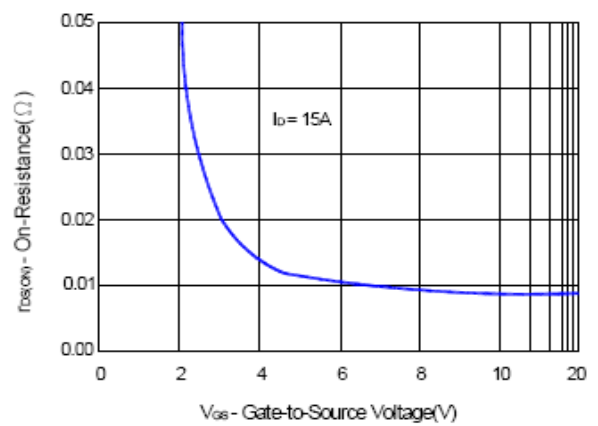
P1004BD

N-Channel Enhancement Mode MOSFET

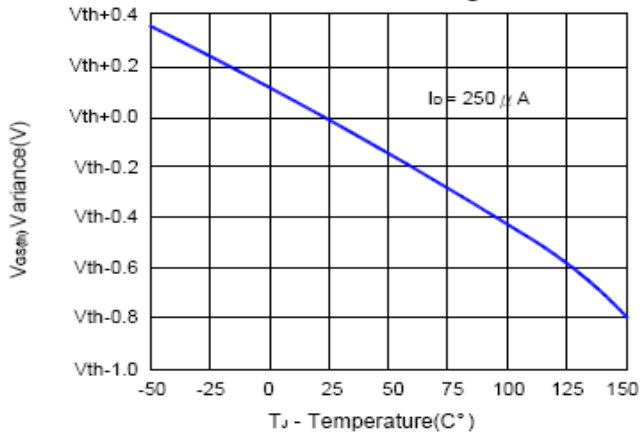
Source - Drain Diode Forward Voltage



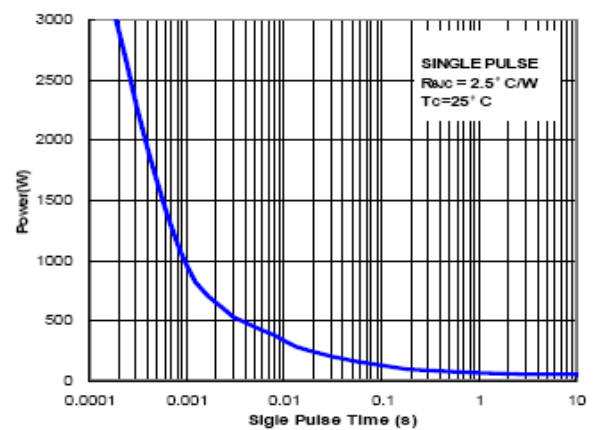
On-Resistance vs. Gate-to-Source Voltage



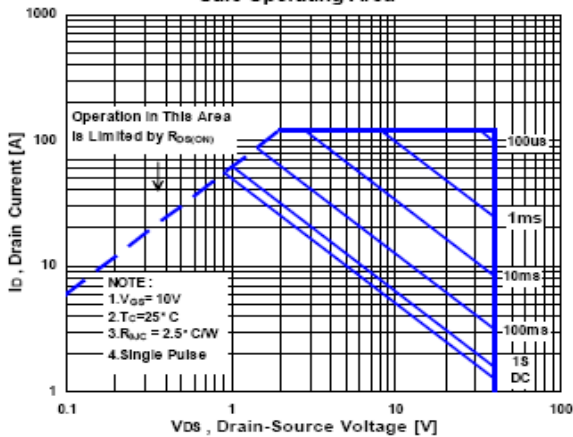
Threshold Voltage



Single Pulse Maximum Power dissipation

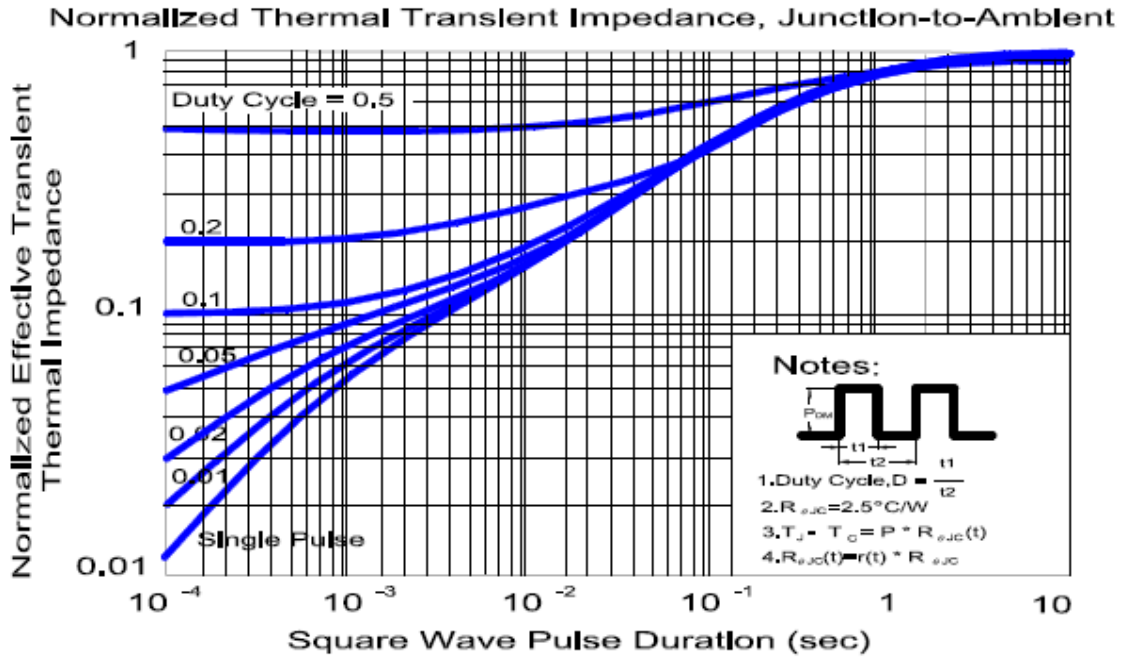


Safe Operating Area



P1004BD

N-Channel Enhancement Mode MOSFET



P1004BD

N-Channel Enhancement Mode MOSFET

Package Dimension

TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	10	10.41	J	4.8		5.64
B	2.1	2.2	2.5	K	0.15		1.49
C	0.4	0.5	0.61	L	0.4	0.76	0.91
D	0.82	1.2	1.5	M	4.2	4.58	5
E	0.35	0.5	0.65	S	4.57	5.1	5.52
F	0		0.2	T	3.81	4.75	5.24
G	5.3	6.1	6.3	U	1.4		1.78
H	0.5		1.7	V	0.55	1.25	1.7
I	6.3	6.5	6.8				

