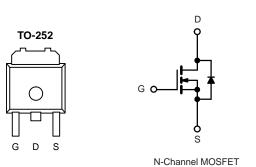


P1606BD-VB Datasheet

N-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY				
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^a		
60	0.010 at V _{GS} = 10 V	58		
00	0.013 at V _{GS} = 4.5 V	56		



FEATURES

- 175 °C Junction Temperature
- Trench Power MOSFET
- Material categorization:



ABSOLUTE MAXIMUM RATINGS ($T_c = 2$	25 °C, unless othe	rwise noted)			
Parameter		Symbol	Limit	Unit	
Gate-Source Voltage	V _{GS}	± 20	V		
Continuous Drain Current (T _{.1} = 175 °C) ^b	T _C = 25 °C	1-	58		
Continuous Drain Current $(T_J = 175 \text{ °C})^2$	T _C = 100 °C		48 ^a		
Pulsed Drain Current	I _{DM}	100	А		
Continuous Source Current (Diode Conduction)		۱ _S	50 ^a		
Avalanche Current	I _{AS} 50				
Single Avalanche Energy (Duty Cycle \leq 1 %)	L = 0.1 mH	E _{AS}	125	mJ	
Maximum Dawar Discipation	T _C = 25 °C	P _D	136	w	
Maximum Power Dissipation	T _A = 25 °C		3 ^b , 8.3 ^{b, c}	VV	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	$t \le 10 \text{ sec}$	R _{thJA}	15	18	°C/W	
Maximum Junction-to-Ambient*	Steady State		40	50		
Maximum Junction-to-Case	•	R _{thJC}	0.85	1.1		

Notes:

a. Package limited.

b. Surface mounted on 1" x 1" FR4 board.

c. t \leq 10 s.



Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit	
Static	-						
Drain-Source Breakdown Voltage V _{DS}		V _{GS} = 0 V, I _D = 250 μA 60				,	
Gate Threshold Voltage	Gate Threshold Voltage V _{GS(th)}		1	2	3	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
		$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}$			1		
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 125 \text{ °C}$			50	50 µA	
		$V_{DS} = 60 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 175 \text{ °C}$	250		250	1	
On-State Drain Current ^b	I _{D(on)}	$V_{DS} = 5 V, V_{GS} = 10 V$	60			А	
		V _{GS} = 10 V, I _D = 20 A		0.010			
	Б	V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C		0.016			
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C		0.020		Ω	
		V _{GS} = 4.5 V, I _D = 15 A	0.013			1	
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 20 A		60		S	
Dynamic							
Input Capacitance	C _{iss}			2650			
Output Capacitance	C _{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		470		pF	
Reverse Transfer Capacitance	C _{rss}			225			
Total Gate Charge ^c	Qg			47	70		
Gate-Source Charge ^c	Q _{gs}	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 50 A		10		nC	
Gate-Drain Charge ^c	Q _{gd}			12		7	
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	V_{DD} = 30 V, R_L = 0.6 Ω		15	25	20	
Turn-Off Delay Time ^c	t _{d(off)}	$\text{I}_\text{D} \cong$ 50 A, V_GEN = 10 V, R_g = 2.5 Ω		35	50	ns	
Fall Time ^c	t _f			20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)		·			
Pulsed Current	I _{SM}				60	А	
Diode Forward Voltage	V _{SD}	$I_{F} = 20 \text{ A}, V_{GS} = 0 \text{ V}$		1	1.5	V	
Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		45	100	ns	

SPECIFICATIONS (T₁ = 25 °C, unless otherwise noted)

Notes:

a. For design aid only; not subject to production testing.

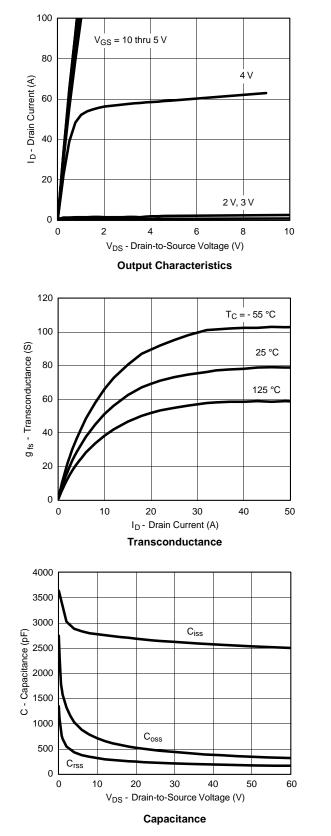
b. Pulse test; pulse width \leq 300 µs, duty cycle \leq 2 %.

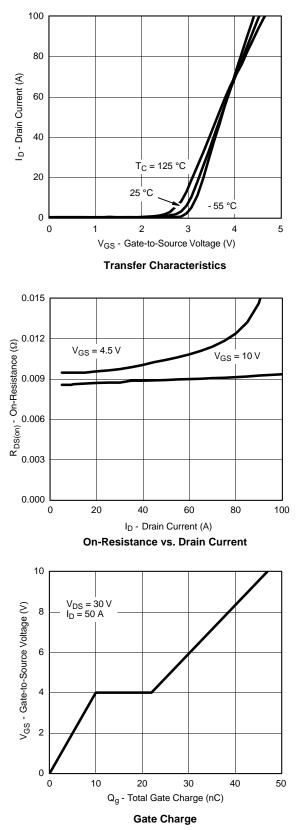
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



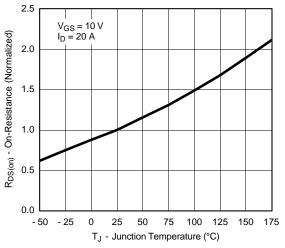




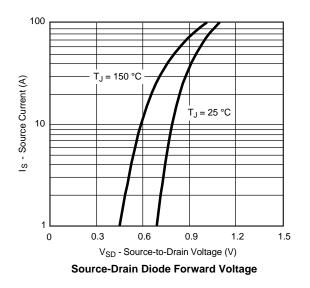




TYPICAL CHARACTERISTICS (25 °C unless noted)

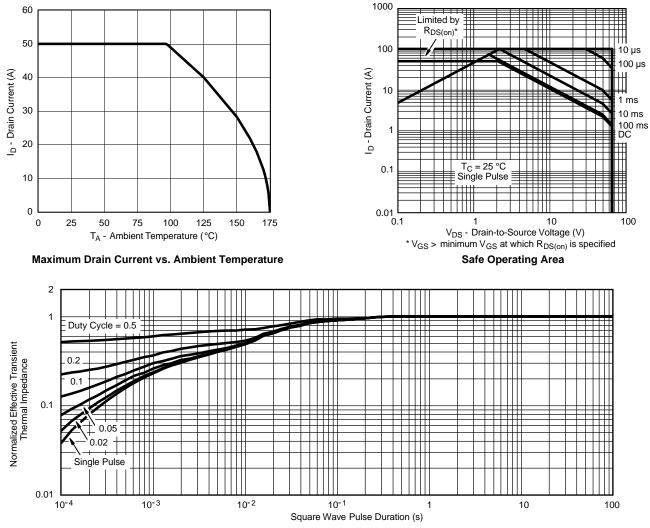


On-Resistance vs. Junction Temperature





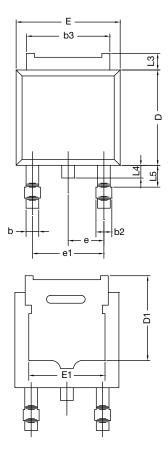
THERMAL RATINGS

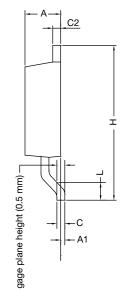


Normalized Thermal Transient Impedance, Junction-to-Case



TO-252AA CASE OUTLINE





	MILLIN	IETERS	INCHES		
DIM.	MIN.	MAX.	MIN.	MAX.	
А	2.18	2.38	0.086	0.094	
A1	-	0.127	-	0.005	
b	0.64	0.88	0.025	0.035	
b2	0.76	1.14	0.030	0.045	
b3	4.95	5.46	0.195	0.215	
С	0.46	0.61	0.018	0.024	
C2	0.46	0.89	0.018	0.035	
D	5.97	6.22	0.235	0.245	
D1	5.21	-	0.205	-	
Е	6.35	6.73	0.250	0.265	
E1	4.32	-	0.170	-	
Н	9.40	10.41	0.370	0.410	
е	2.28	BSC	0.090 BSC		
e1	4.56	4.56 BSC		BSC	
L	1.40	1.78	0.055	0.070	
L3	0.89	1.27	0.035	0.050	
L4	-	1.02	-	0.040	
L5	1.14	1.52	0.045	0.060	
ECN: X12- DWG: 534	0247-Rev. M, 7	24-Dec-12			

Note

• Dimension L3 is for reference only.



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