

MTP12N10E-VB Datasheet N-Channel 100-V (D-S) MOSFET

PRODUCT	SUMMARY	
V _{(BR)DSS} (V)	R _{DS(on)} (Ω)	I _D (A)
100	0.127at V _{GS} = 10 V	18

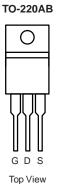
FEATURES

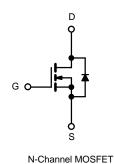
- TrenchFET[®] Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package
- 100 % R_g Tested

APPLICATIONS

• Isolated DC/DC Converters







Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	100	V
Gate-Source Voltage		V _{GS}	± 20	V
Continuous Drain Current ($T_1 = 175 ^{\circ}C$)	T _C = 25 °C	I_	18	
Continuous Drain Current (1) = 175 C)	T _C = 125 °C	I _D	15	٨
Pulsed Drain Current		I _{DM}	68	A
Avalanche Current	L = 0.1 mH	I _{AS}	18	
Single Pulse Avalanche Energy ^b	L = 0.1 IIIH	E _{AS}	200	mJ
Maria Dia ing ting b	T _C = 25 °C	P	105	14/
Maximum Power Dissipation ^b	T _A = 25 °C ^d	– P _D –	3.75	- W
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C

THERMAL RESISTANCE R	ATINGS			
Parameter		Symbol	Limit	Unit
Junction-to-Ambient	PCB Mount (TO-263) ^d	R _{thJA}	40	°C/W
Junction-to-Case (Drain)		R _{thJC}	0.4	C/W

Notes:

- a. Package limited.
- b. Duty cycle \leq 1 %.
- c. See SOA curve for voltage derating.

d. When Mounted on 1" square PCB (FR-4 material).

Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	$V_{DS} = 0 \text{ V}, I_{D} = 250 \mu\text{A}$	100			
Gate-Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	2		4	V
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
		$V_{DS} = 100 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50	μA
		$V_{DS} = 100 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \text{ T}_{J} = 175 ^{\circ}\text{C}$			250	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, \text{ V}_{GS} = 10 \text{ V}$	120			Α
		V _{GS} = 10 V, I _D = 20 A		0.127		
Drain-Source On-State Resistance ^a	r _{DS(on)}	V_{GS} = 10 V, I_{D} = 20 A, T_{J} = 125 °C		0.130		Ω
		V_{GS} = 10 V, I_{D} = 20 A, T_{J} = 175 °C		0.170		
Forward Transconductancea	9 _{fs}	V _{DS} = 15 V, I _D = 20 A	25			S
Dynamic ^b						
Input Capacitance	C _{iss}			1300		
Output Capacitance	C _{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		260		pF
Reverse Transfer Capacitance	C _{rss}			110		
Total Gate Charge ^c	Qg				28	
Gate-Source Charge ^c	Q _{gs}	V_{DS} = 100 V, V_{GS} = 10 V, I_{D} = 65 A			4.8	nC
Gate-Drain Charge ^c	Q _{gd}				15	
Gate Resistance	Rg		0.5	1.7	3.3	Ω
Turn-On Delay Time ^c	t _{d(on)}			8		
Rise Time ^c	t _r	V_{DD} = 100 V, R _L = 1.5 Ω		120		
Turn-Off Delay Time ^c	t _{d(off)}	$I_D \cong 65 \text{ A}, \text{ V}_{\text{GEN}} = 10 \text{ V}, \text{ R}_{g} = 2.5 \Omega$		25		ns
Fall Time ^c	t _f			50		
Source-Drain Diode Ratings and Cha	aracteristics 7	Γ _C = 25 °C ^b				
Continuous Current	۱ _S			18		
Pulsed Current	I _{SM}			68		A
Forward Voltage ^a	V _{SD}	I _F = 65 A, V _{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t _{rr}			130	200	ns
Peak Reverse Recovery Current	I _{RM(REC)}	I _F = 50 A, di/dt = 100 A/μs		8	12	А
Reverse Recovery Charge	Q _{rr}			0.52	1.2	μC

Notes:

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

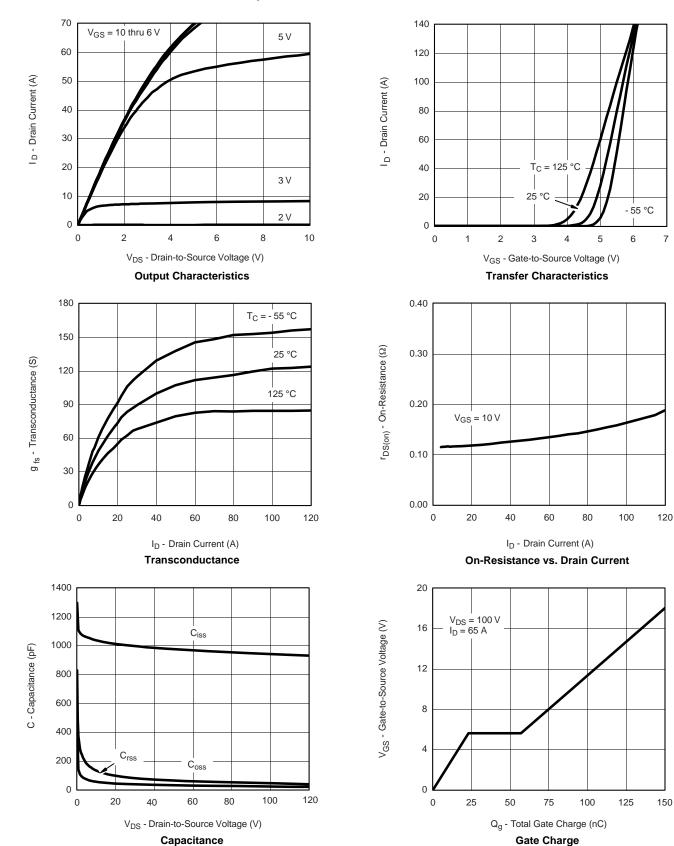
b. Guaranteed by design, not subject to production testing.

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.

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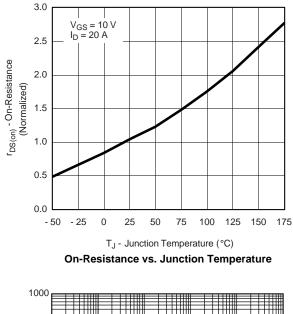


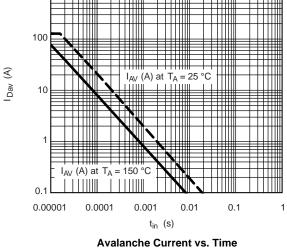


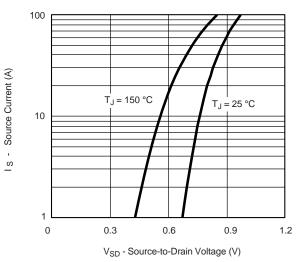
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



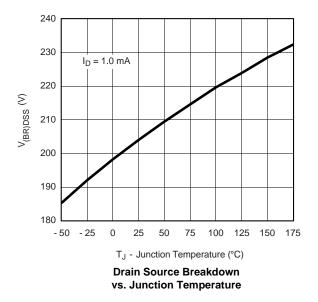
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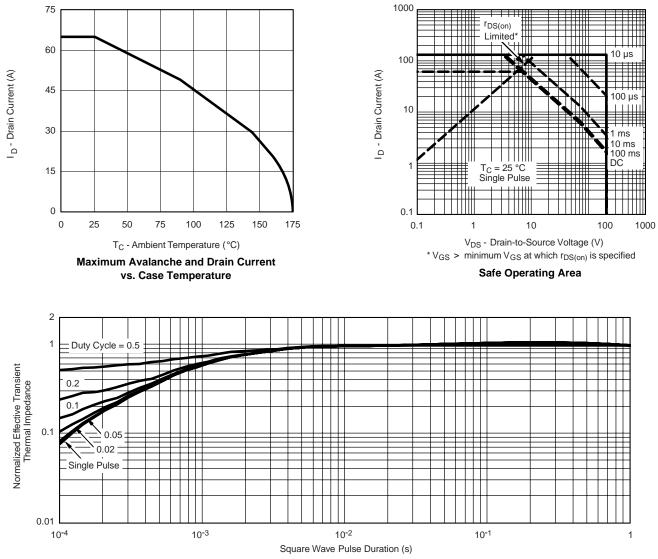
Source-Drain Diode Forward Voltage



MTP12N10E-VB



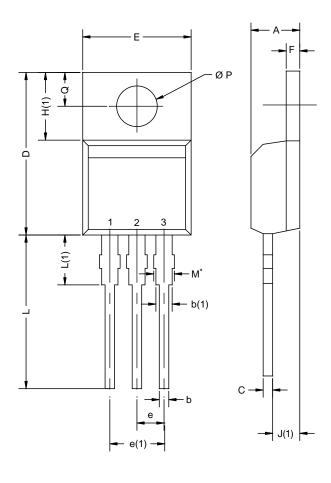
THERMAL RATINGS



Normalized Thermal Transient Impedance, Junction-to-Case



TO-220AB



	MILLIN	IETERS	INCHES		
DIM.	MIN.	MAX.	MIN.	MAX.	
А	4.25	4.65	0.167	0.183	
b	0.69	1.01	0.027	0.040	
b(1)	1.20	1.73	0.047	0.068	
с	0.36	0.61	0.014	0.024	
D	14.85	15.49	0.585	0.610	
Е	10.04	10.51	0.395	0.414	
е	2.41	2.67	0.095	0.105	
e(1)	4.88	5.28	0.192	0.208	
F	1.14	1.40	0.045	0.055	
H(1)	6.09	6.48	0.240	0.255	
J(1)	2.41	2.92	0.095	0.115	
L	13.35	14.02	0.526	0.552	
L(1)	3.32	3.82	0.131	0.150	
ØΡ	3.54	3.94	0.139	0.155	
Q	2.60	3.00	0.102	0.118	
ECN: X12- DWG: 547	0208-Rev. N, 1	08-Oct-12			

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM



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