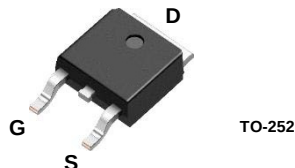


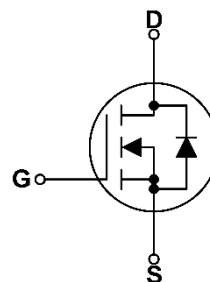
Features

- N-Channel: 100V 116A
 $R_{DS(on)Typ} = 4.2m\Omega @ V_{GS} = 10V$
- Very Low On-resistance $R_{DS(on)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

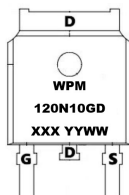


General Description

This Power MOSFET is produced using WPMtek's advanced Shielding Gate MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for low voltage applications such as DC/DC converters and high efficiency switching for power management in portable and battery operated products.



Marking:



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	WTM120N10GD	Units
V_{DSS}	Drain-Source Voltage	100	V
I_D	Drain Current ¹⁾ - Continuous ($T_C = 25^\circ\text{C}$)	116	A
	- Continuous ($T_C = 100^\circ\text{C}$)	84	A
I_{DM}	Drain Current ¹⁾ - Pulsed	464	A
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy ²⁾	270	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	134	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260	$^\circ\text{C}$

Thermal Characteristics

R_{thJC}	Thermal Resistance, Junction to Case	0.93	$^\circ\text{C/W}$
R_{thJA}	Thermal Resistance, Junction to ambient	62	$^\circ\text{C/W}$

Package

Part Number	Package	Packing Method	MOQ	QTY
WTM120N10GD	TO-252	Tape & Reel	2500	25000

Electrical Characteristics

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	--	4.2	5.2	m Ω

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 500\text{ kHz}$	--	3070	--	pF
C_{oss}	Output Capacitance		--	1632	--	pF
C_{rss}	Reverse Transfer Capacitance		--	65	--	pF
R_g	Gate Resistance	$f = 1\text{ MHz}, \text{open drain}$	--	2	--	Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{ V}, V_{DS} = 80\text{ V},$ $R_G = 20\text{ }\Omega, I_D = 30\text{ A}$	--	6	--	ns
t_r	Turn-On Rise Time		--	82	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	28	--	ns
t_f	Turn-Off Fall Time		--	93	--	ns
Q_g	Total Gate Charge	$V_{DS} = 50\text{ V}, I_D = 80\text{ A},$ $V_{GS} = 10\text{ V}$	--	43	--	nC
Q_{gs}	Gate-Source Charge		--	15	--	nC
Q_{gd}	Gate-Drain Charge		--	11	--	nC

Drain-Source Diode Characteristics

I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	116	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	464	A
V_{SD}	Drain to Source Diode Forward Voltage, $V_{GS} = 0\text{ V}, I_{SD} = 20\text{ A}, T_J = 25^\circ\text{C}$	--	0.8	--	V

Notes:

1. Repetitive Rating: Drain current is limited by the package.
2. E_{AS} condition: $T_J = 25^\circ\text{C}, V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, L = 0.5\text{ mH}$.
3. These curves are based on the junction-to-case thermal impedance $R_{\theta jc}$, assuming maximum junction temperature is 150°C . These curves provide a single pulse rating.

N- Channel Typical Characteristics

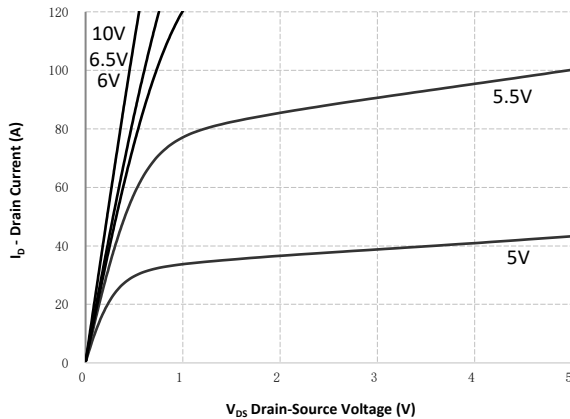


Figure 1. On-Region Characteristics

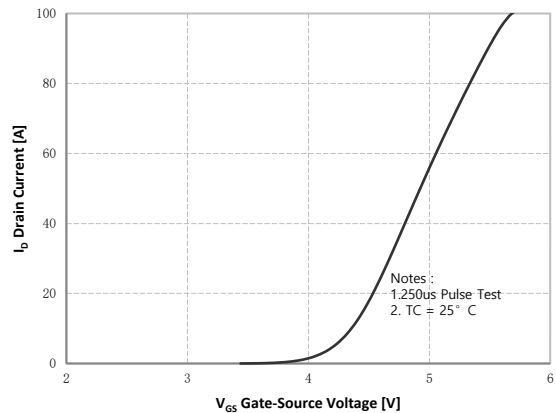


Figure 2. Transfer Characteristics

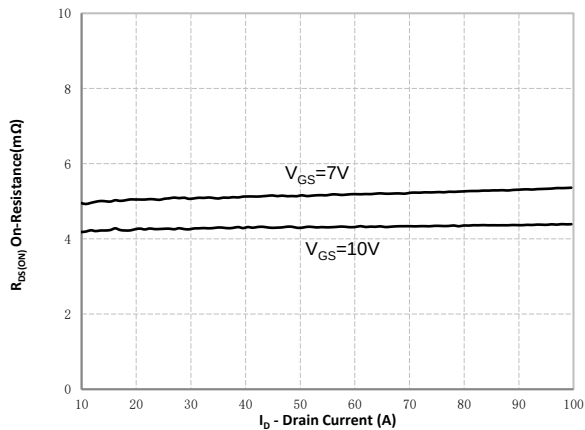


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

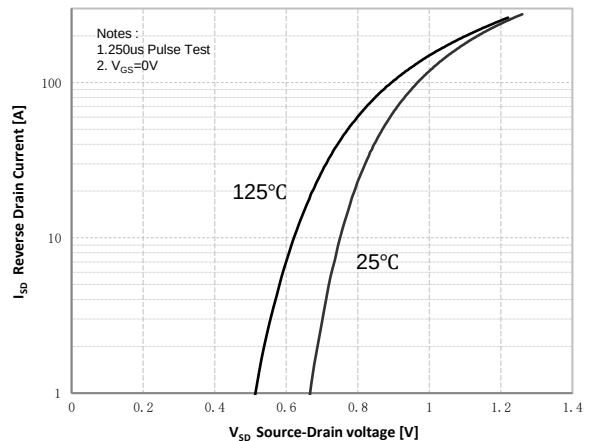


Figure 4. Body Diode Forward Voltage Variation with Source Current

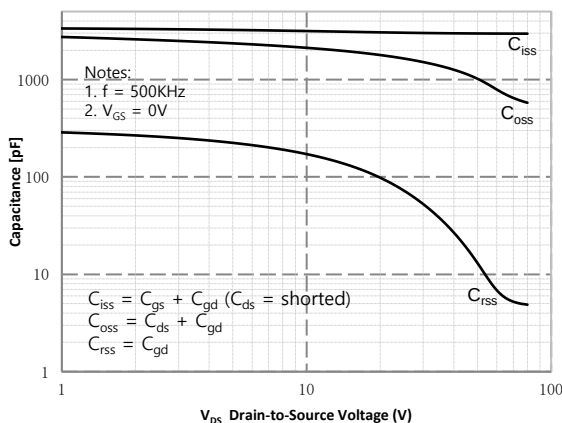


Figure 5. Capacitance Characteristics

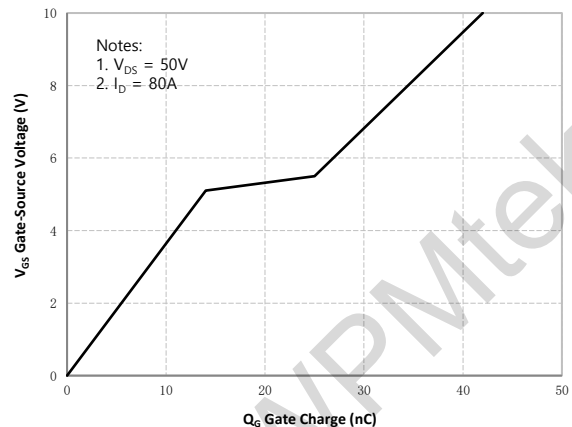


Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

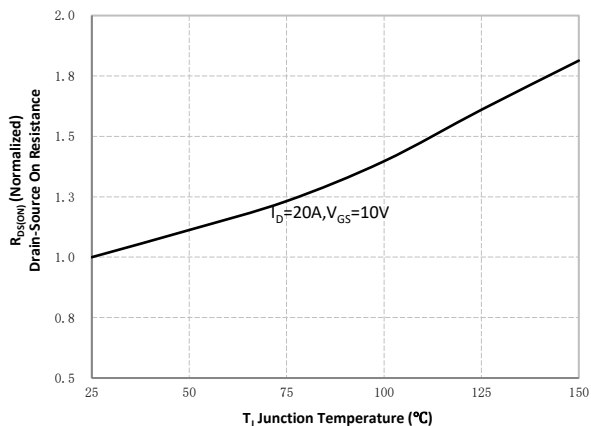


Figure 7. On-Resistance Variation vs Temperature

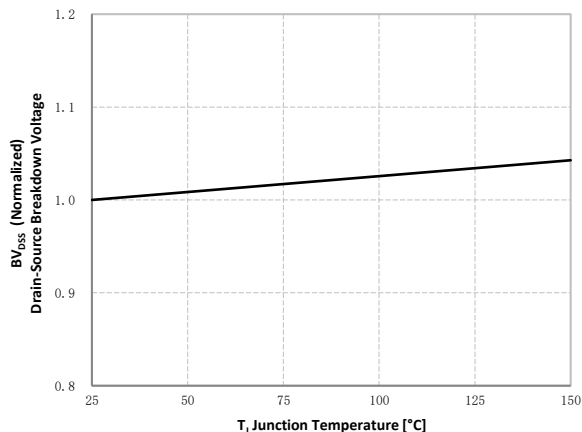


Figure 8. Breakdown Voltage Variation vs Temperature

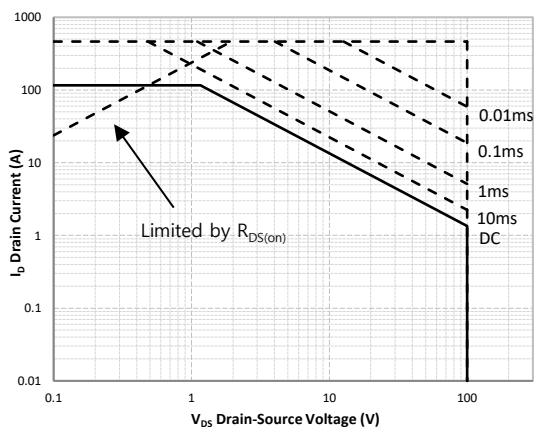


Figure 9. Maximum Safe Operating Area³⁾

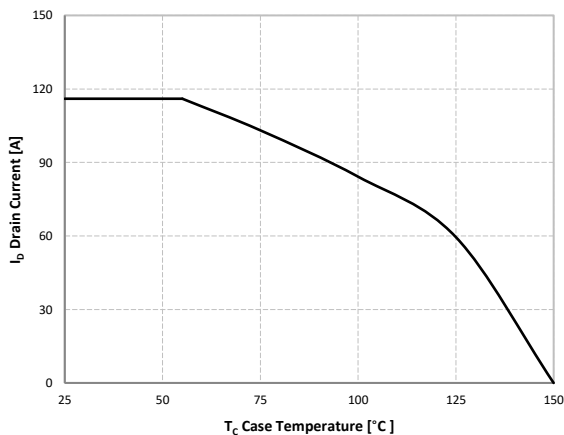


Figure 10. Maximum Continuous Drain Current vs Case Temperature

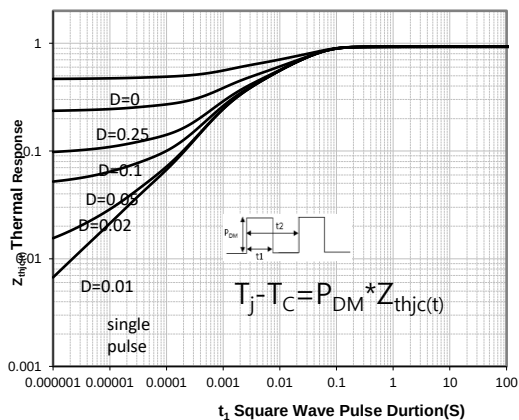
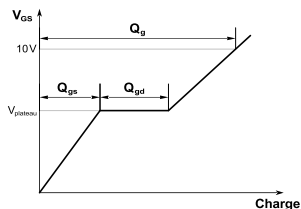
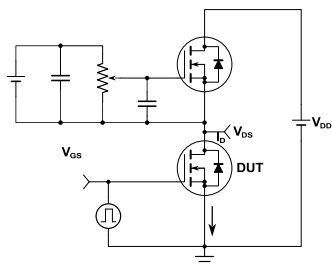
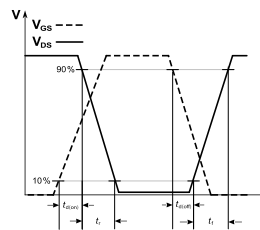
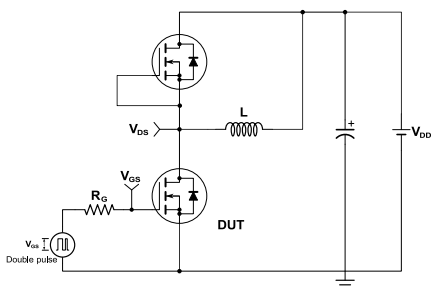


Figure 11. Transient Thermal Response Curve

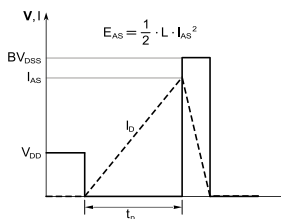
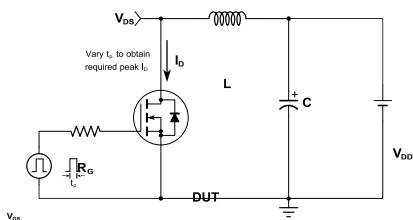
Test Circuits and waveforms



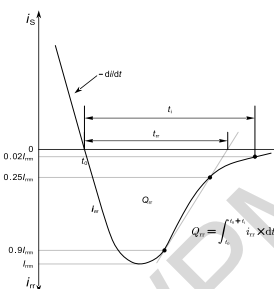
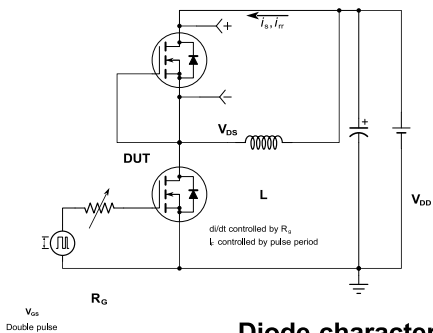
Gate charge test circuit & waveform



Switching times for inductive load test circuit & waveform

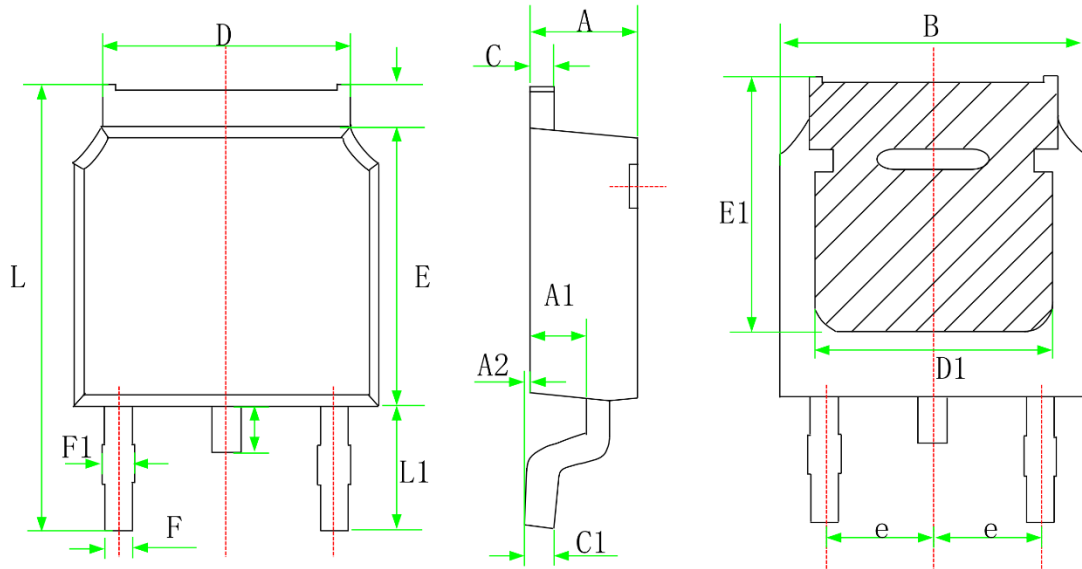


Unclamped inductive load test circuit & waveform



Diode characteristics test circuit & waveform

TO-252 OUTLINE



SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX		MIN	NOM	MAX
A	2.2	2.3	2.4	D	5.1	5.25	5.46
A1	0.93	1.07	1.17	D1	4.4	4.83	5.35
A2	0		0.15	E	5.9	6.1	6.3
B	6.4	6.6	6.8	E1	4.95	5.15	5.35
C	0.43	0.5	0.61	L	9.8	10.1	10.4
C1	0.45	0.5	0.6	L1	2.6	2.8	3
F	0.61	0.76	0.91	e	2.186	2.286	2.386
F1	0.65	0.85	1.05				

NAME	TO-252 OUTLINE	UNIT	mm	DESIGNED	sn	THIRD ANGLE SYSTEM
DWGNO		PAGE	1 OF 1	CHECKED		
VERSION	Ver1.1	ISSUE DATE		APPROVED		

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