

FEATURES

- $R_{DS(ON)} < 9m\Omega$ @ $V_{GS} = 10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.

MECHANICAL DATA

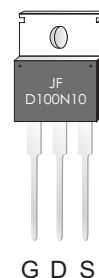
- Case: TO-220 Package

Ordering Information

Part No.	Package	Packing
D100N10-TU	TO-220	50pcs / Tube

PRODUCT SUMMARY

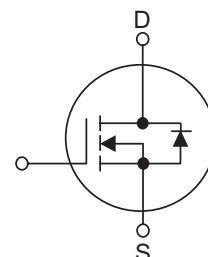
V_{DS} (V)	$R_{DS(on)}$ (M Ω)	I_D (A)
100	9 @ $V_{GS} = 10V$	110



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source



ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 25	V
Continuous Drain Current	I_D	115	A
Pulsed Drain Current (NOTE 1)	I_{DM}	450	A
Avalanche Energy (NOTE 2)	E_{AS}	450	mJ
Power Dissipation	P_D	220	W
Junction Temperature	T_J	+175	C
Storage Temperature	T_{STG}	-55 ~ +175	C

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $L = 0.5mH$, $I_D = 42A$, Starting $T_J = 25\text{ C}$

D100N10

100V N-Channel Power MOSFET

THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	75	C/W
Junction to Case	θ_{JC}	0.68	C/W

ELECTRICAL CHARACTERISTICS (T_C=25 C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}			100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =50A		6.8	9	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance (4)	C _{ISS}	V _{DS} =50V, V _{GS} =0V, f=1MHz		5000		pF
Output Capacitance(4)	C _{OSS}			339		pF
Reverse Transfer Capacitance(4)	C _{RSS}			179		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time (4)	t _{D(ON)}	V _{DD} =50V, I _D =30A, V _{GS} =10V R _G =6.8Ω		24		ns
Turn-On Rise Time(4)	t _R			34		ns
Turn-Off Delay Time(4)	t _{D(OFF)}			75		ns
Turn-Off Fall Time (4)	t _F			45		ns
Total Gate Charge(4)	Q _G	V _{DD} =50V, I _D =30A, V _{GS} =10V		120		nC
Gate-Source Charge(4)	Q _{GS}			16		nC
Gate-Drain Charge(4)	Q _{GD}			28		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage (3)	V _{SD}	V _{GS} =0V, I _S =100A			1.3	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _S =50A DI _F /dt=100A/μs		46		ns
Reverse Recovery Charge	Q _{rr}			98		nC
Grid Resistance(4)	R _G	V _{DD} =0V, V _{GS} =0V, F=1MHz		1.8		Ω

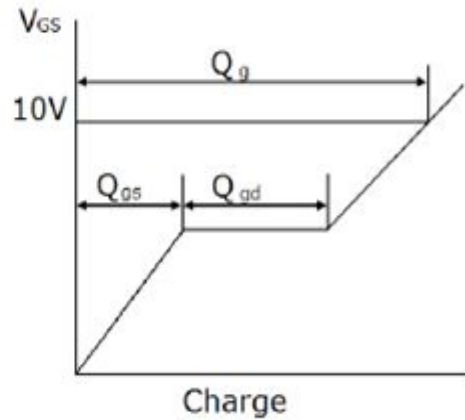
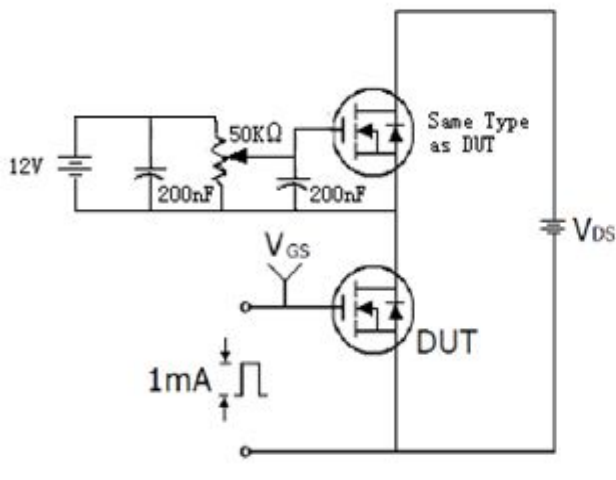
Notes: 3. Pulse Test: Pulse width ≤300μs, Duty cycle≤2%.

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

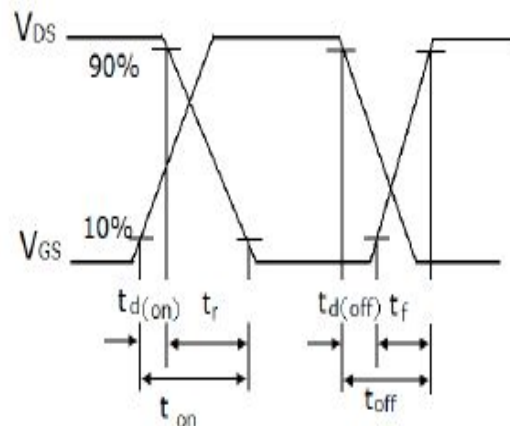
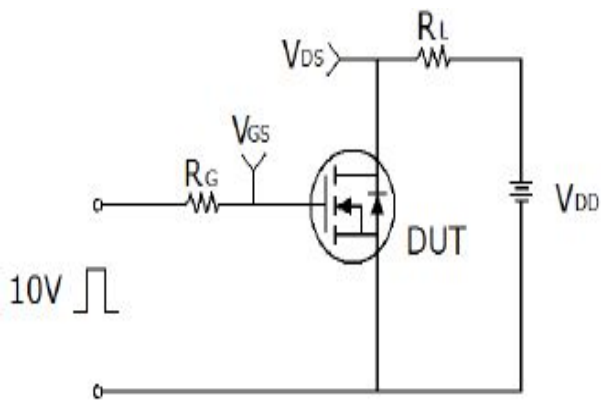
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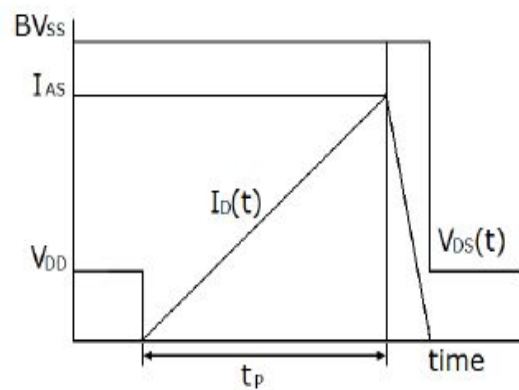
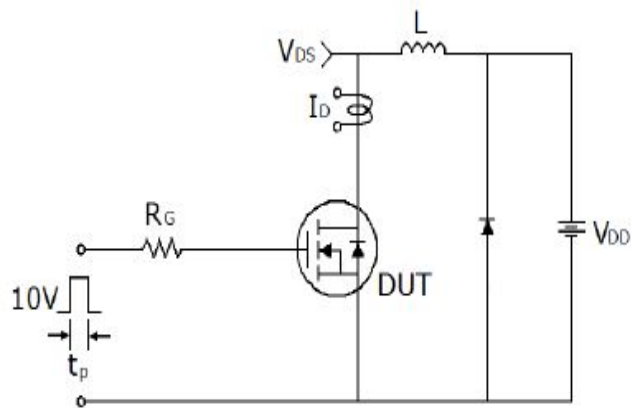
TEST CIRCUITS AND WAVEFORMS



1) Gate charge test circuit & Waveform



2) Switch Time Test Circuit:



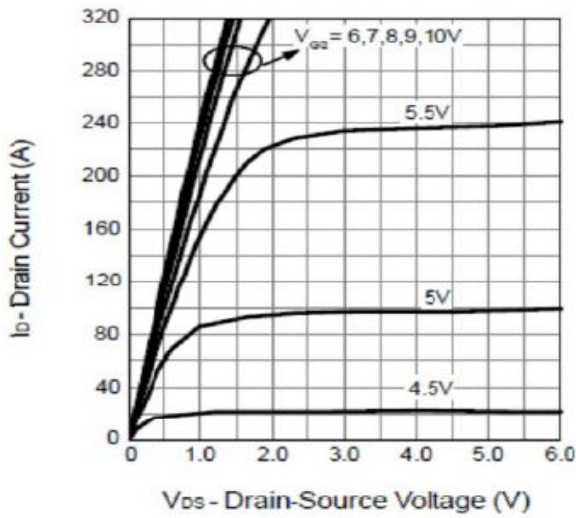
3) Unclamped Inductive Switching Test Circuit & Waveforms

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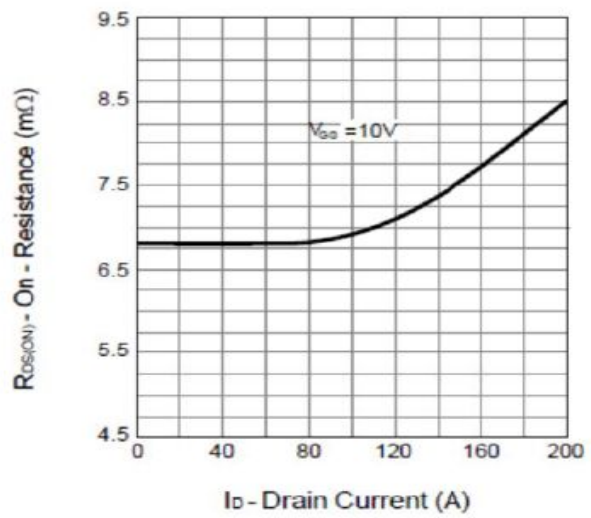
100V N-Channel Power MOSFET

TYPICAL CHARACTERISTICS

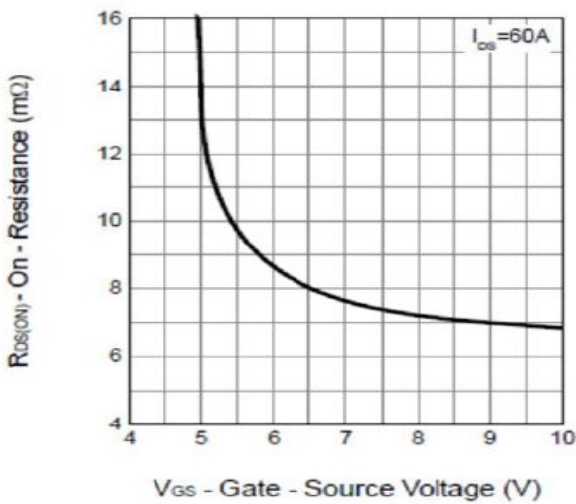
Output Characteristics



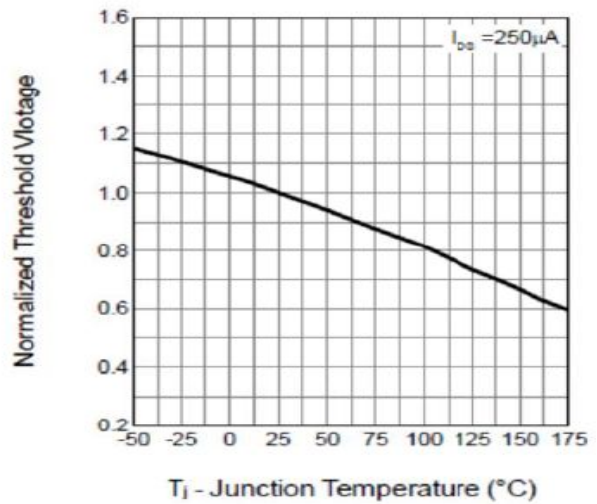
Drain-Source On Resistance



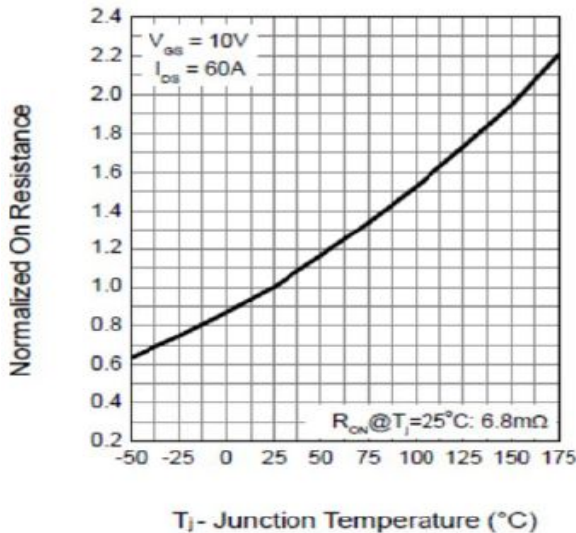
Drain-Source On Resistance



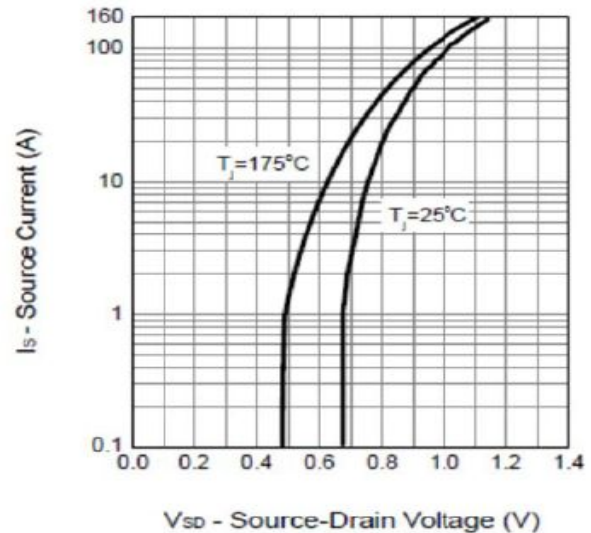
Gate Threshold Voltage



Drain-Source On Resistance



Source-Drain Diode Forward

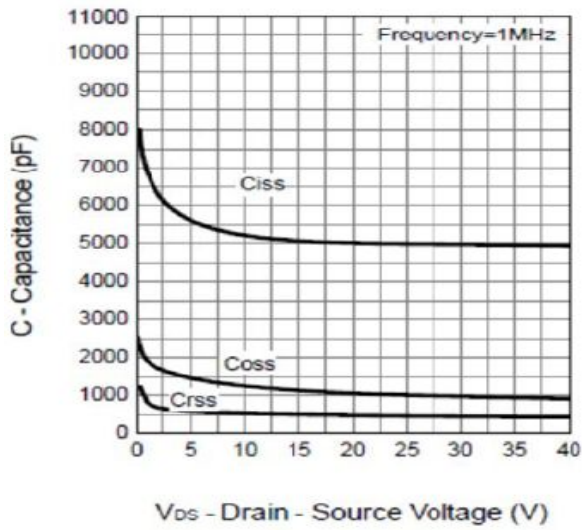


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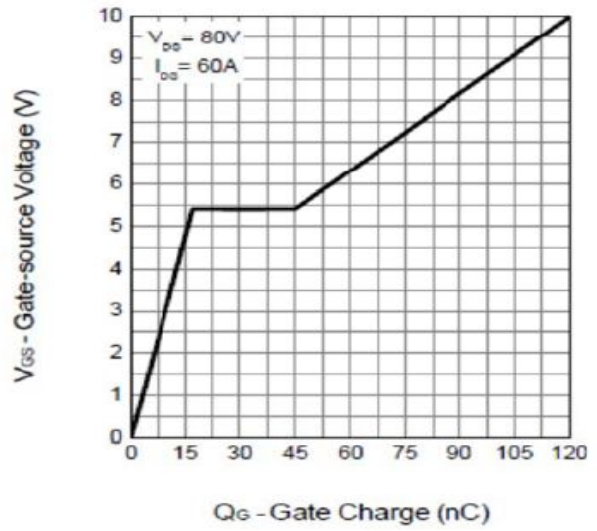
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TYPICAL CHARACTERISTICS

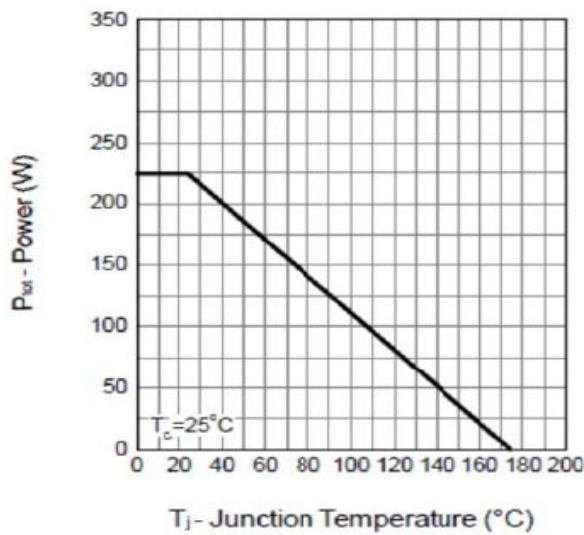
Capacitance



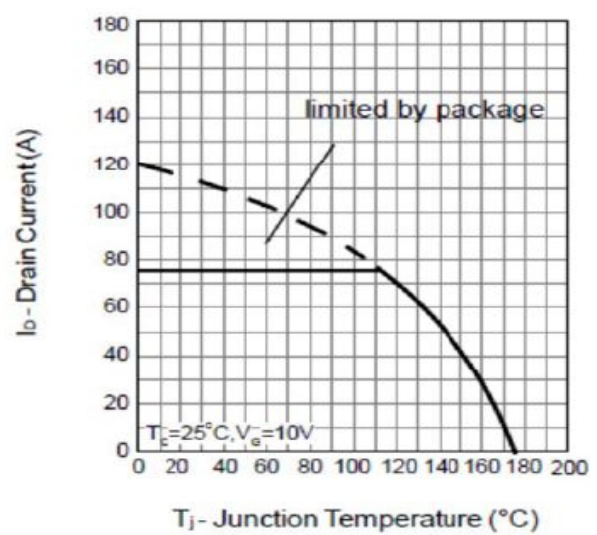
Gate Charge



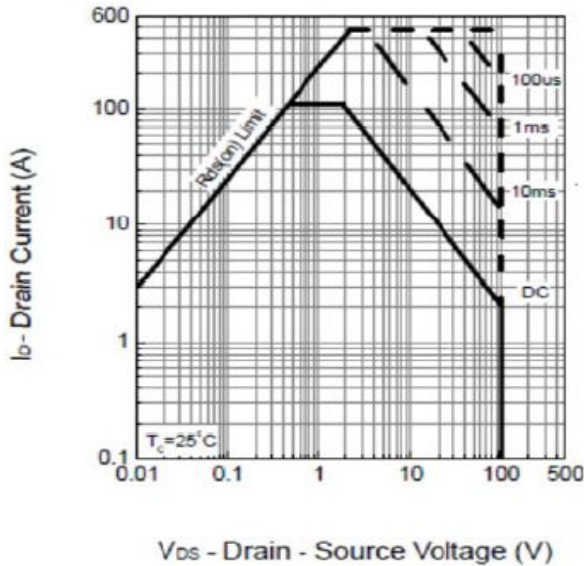
Power Dissipation



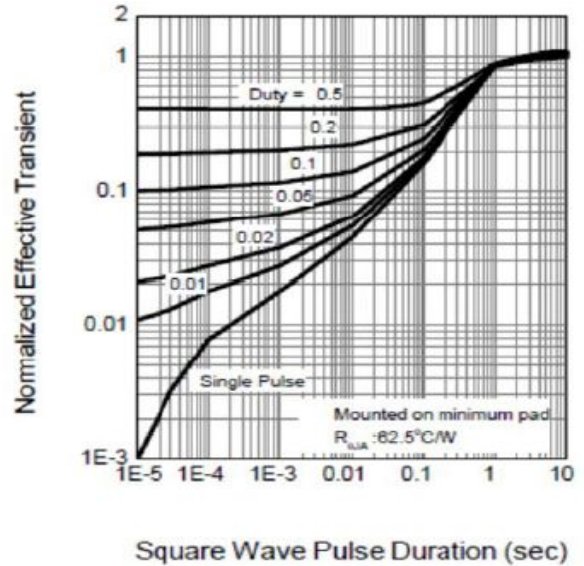
Drain Current



Safe Operation Area



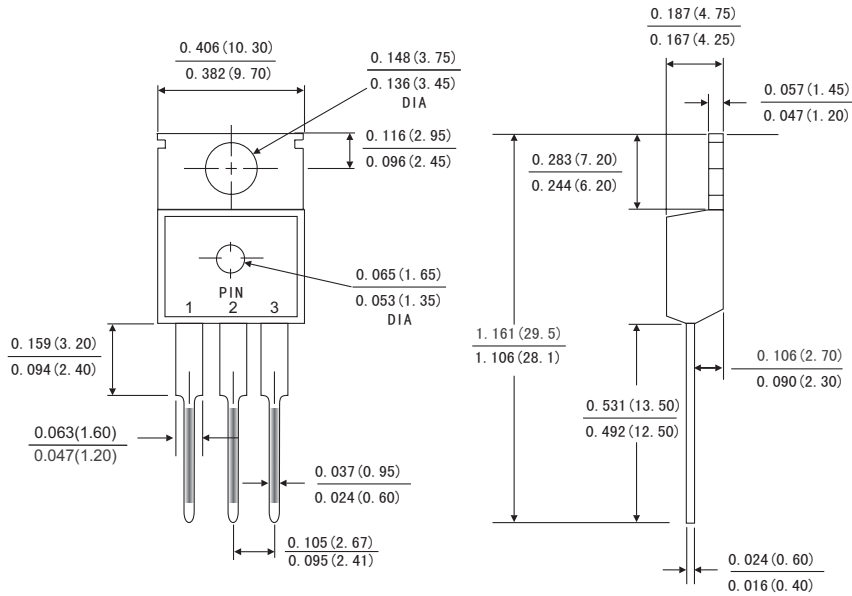
Thermal Transient Impedance



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TO-220



Dimensions in inches and (millimeters)