MT8233N3

N-Channel Enhancement Mode Field Effect Transistor

MT Semiconductor®

http://www.mtsemi.com

Product Summary

- V_{DS}= 20V
- I_D= 10A
- $R_{DS(ON)}$ 8.3 mΩ@V_{GS}= 4.5V/5A
- $R_{DS(ON)}$ 10.7 mΩ@V_{GS}= 2.5V/5A

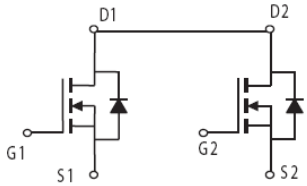
Features

- Advanced Trench Process Technology.
- High Density Cell Design for Ultra Low On-Resistance.
- RoHS Compliant.
- DFN2X3-6L package design

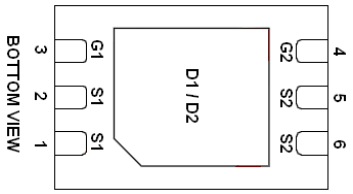
Applications：

- Load Switch.
- PWM Applications.

Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	10	A
	T_A=70℃		8	
Pulsed Drain Current		I_{DM}	40	A
Power Dissipation	T_A=25℃	P_D	1.56	W
	T_A=70℃		1.0	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	65	℃/W

Ordering Information

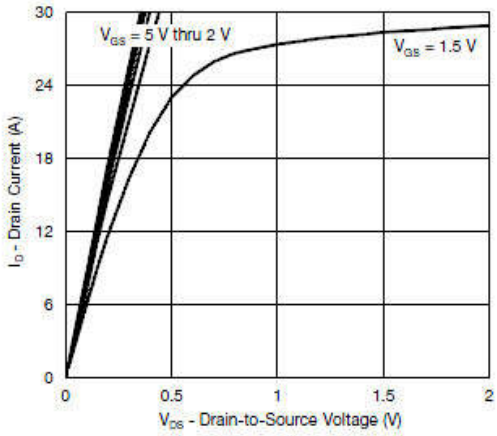
Part Ordering No.	Part Marking	Package	Unit	Quantity
MT8233N3	MT8233N3	DFN2X3-6L	Tape & Reel	3000

Electrical Characteristics

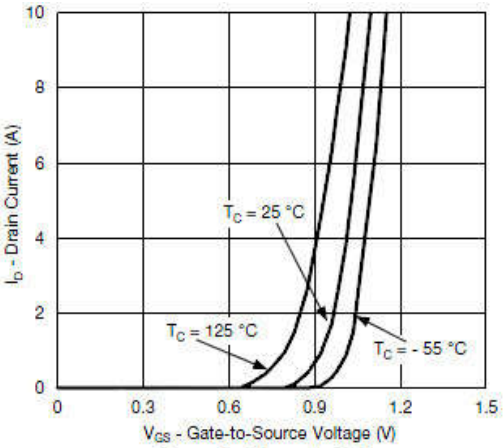
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.5	0.7	1.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V			10	uA
		V_{DS}=16V,V_{GS}=0V T_J=85℃			50	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=4.5V	10			A
		V_{DS}≧5V,V_{GS}=2.5V	8			
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=4.5V,I_D=5.0A		8.3	11	mΩ
		V_{GS}=3.8V,I_D=5.0A		8.8	12.5	
		V_{GS}=2.5V,I_D=5.0A		10.7	15.5	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=12.4A		70		S
Diode Forward Voltage	V_{SD}	I_S=3.0A,V_{GS}=0V		0.85	1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V I_D=10A		15	25	nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			4		
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V f=1MHz		1400		pF
Output Capacitance	C_{oss}			200		
Reverse Transfer Capacitance	C_{rss}			80		
Turn-On Time	$t_{d(on)}$	V_{DD}=10V,R_L=1.0Ω I_D≡10A,V_{GEN}=4.5V R_G=1Ω		10	20	ns
	t_r			15	30	
Turn-Off Time	$t_{d(off)}$			35	70	
	t_f			10	20	

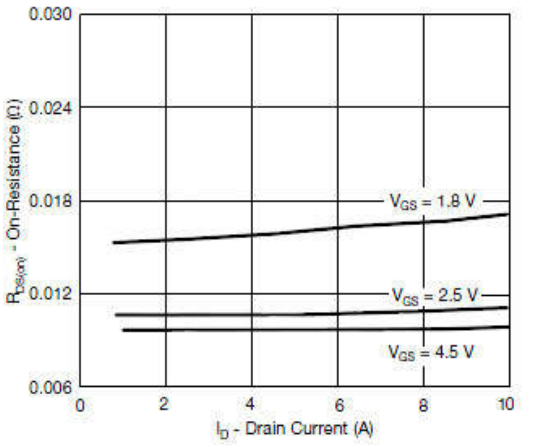
Typical Characteristics



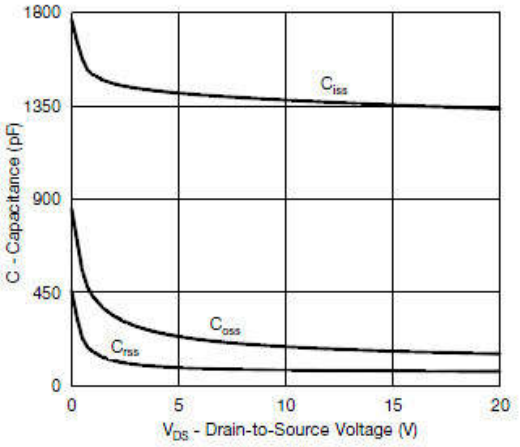
Output Characteristics



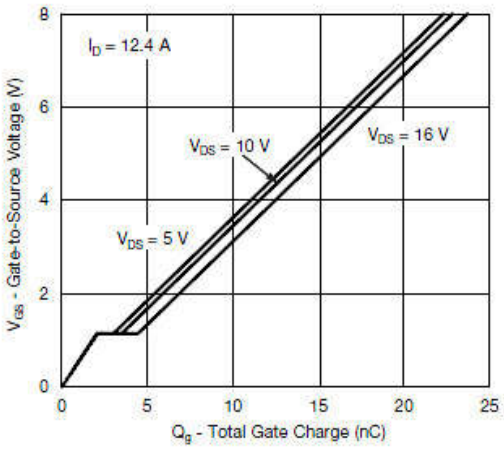
Transfer Characteristics



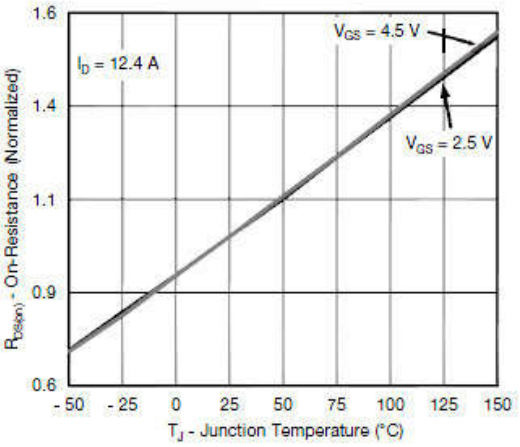
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

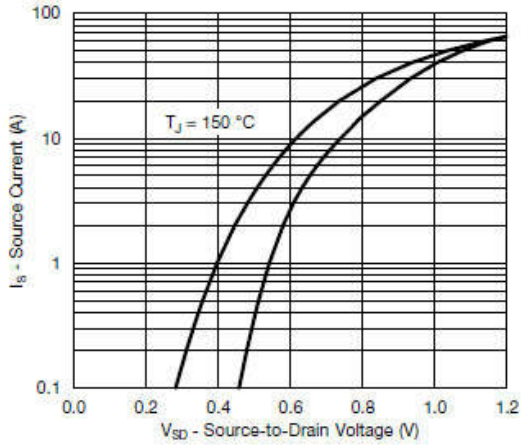


Gate Charge

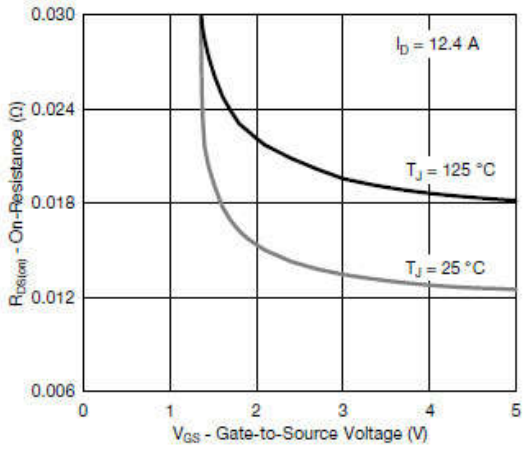


On-Resistance vs. Junction Temperature

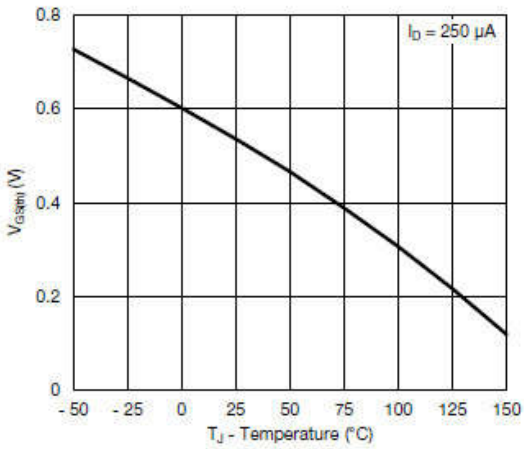
Typical Characteristics



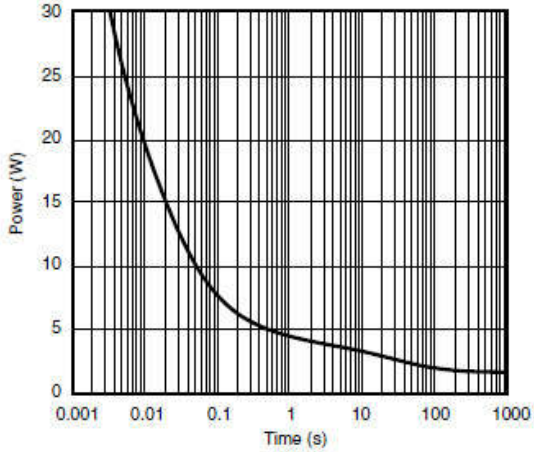
Soure-Drain Diode Forward Voltage



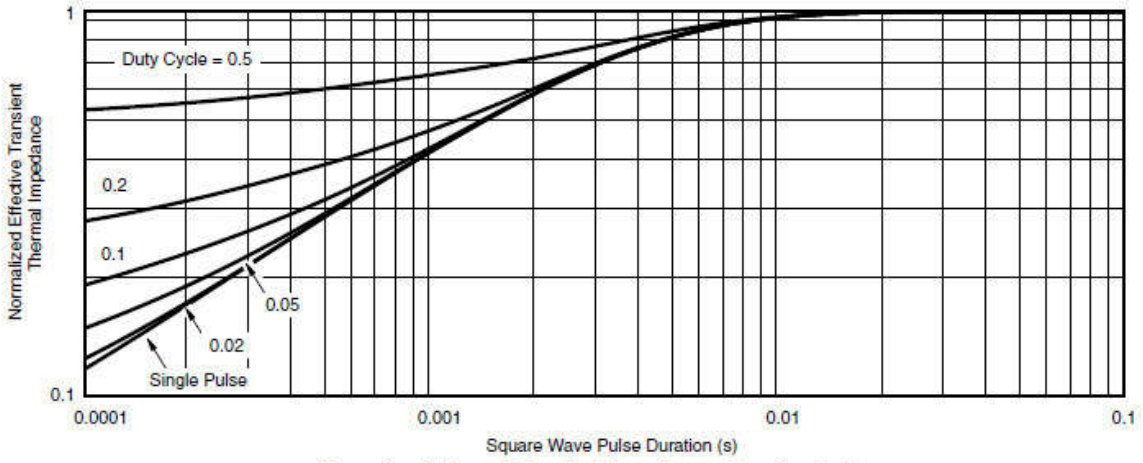
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



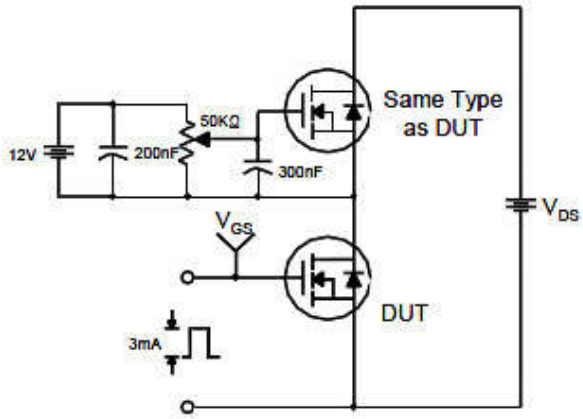
Single Pulse Power, Junction-to-Ambient

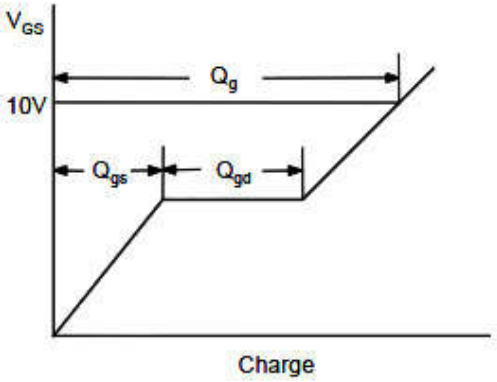


Normalized Thermal Transient Impedance, Junction-to-Case

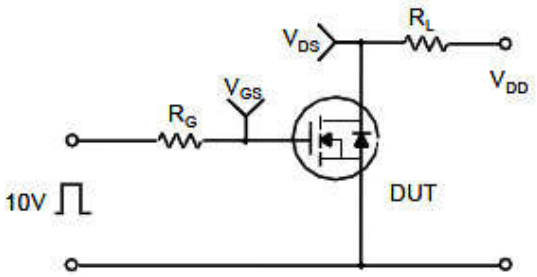
Typical Characteristics

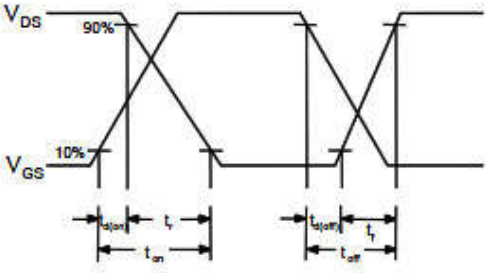
Gate Charge Test Circuit & Waveform



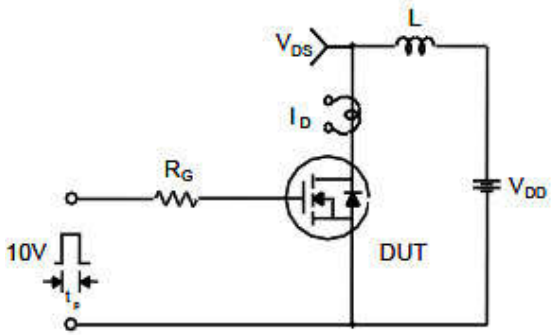


Resistive Switching Test Circuit & Waveforms

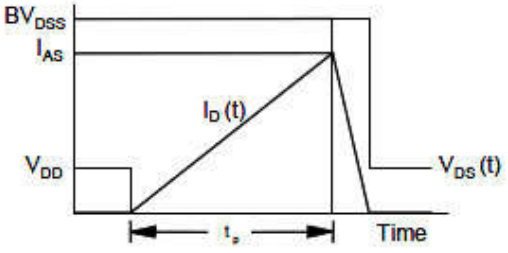




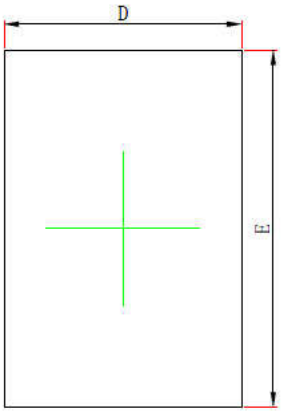
Unclamped Inductive Switching Test Circuit & Waveforms



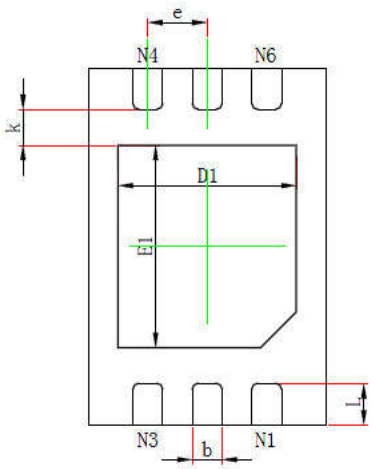
$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



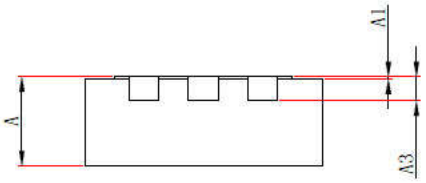
Package Information (DFN2X3-6L)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.950	2.050	0.077	0.081
E	2.950	3.050	0.116	0.120
D1	1.450	1.550	0.057	0.061
E1	1.650	1.750	0.065	0.069
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.300	0.400	0.012	0.016

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