MT3208A/B

N-Channel Power MOSFET

80V, 110A, 6.5mΩ

MT Semiconductor®

http://www.mtsemi.com

Features

- $R_{DS(on)}$ = 6.5mΩ / V_{GS} = 10V, I_D = 30A
- Fast Switching Speed
- Low Gate Charge
- High Performance Trench Technology for Extr emely Low $R_{DS(on)}$
- High Power and Current Handling Capability
- RoHS Compliant

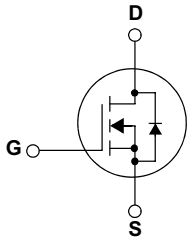
General Description

This N-Channel MOSFET is produced using MOS-TECH Semiconductor's advanced PowerTrench process that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

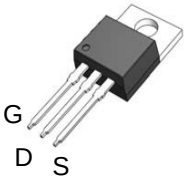
Applications

- DC-DC primary bridge
- DC-DC Synchronous rectification
- Hot swap

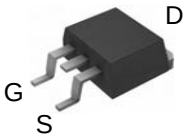
Simplified Schematic



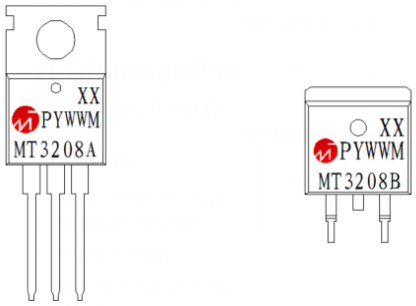
MARKING DIAGRAM & PIN ASSIGNMENT



TO-220FB-3L



TO-263-2L



Package Code

MT3208A: TO-220FB-3L

MT3208B: TO-263-2L

Date Code PYWWM

Lot No XX

MOSFET Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter			Ratings	Units
V_{DSS}	Drain to Source Voltage			80	V
V_{GSS}	Gate to Source Voltage			±25	V
I_D	Drain Curren	- Continuous (Silicon Limited)	T_C = 25°C	110	A
		- Continuous(Package Limited)	T_C =100°C	70	
		- Continuous	T_C =125°C(Note 1a)	50	
		- Pulsed		400	A
E_{AS}	Single Pulsed Avalanche Energy		(Note 3)	530	mJ
P_D	Power Dissipation	- T_C = 25°C	(Note 1a)	200	W
		- T_A = 25°C	(Note 1b)	2.2	W/°C
T_J, T_{STG}	Operating and Storage Temperature Range			-55 to +150	°C

Thermal Characteristics

Symbol	Parameter		Ratings	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	(Note 1)	0.75	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	(Note 1a)	62.5	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
MT3208A/B	MT3208A/B	TO-220/TO-263	-	-	50

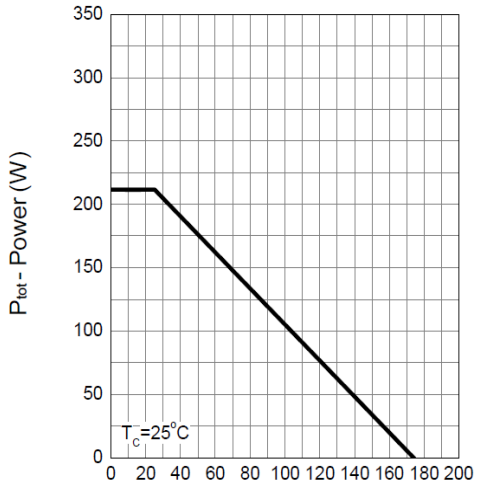
Electrical Characteristics T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
B_{VDSS}	Drain to Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 24V, V_{GS} = 0V	-	-	1	μA
		V_{DS} = 24V, V_{GS} = 0V, T_C = 150°C	-	-	250	
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(TH)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250μA	-	3.0	-	V
$r_{DS(ON)}$	Drain to Source On Resistance	I_D = 30A, V_{GS} = 10V	-	6.5	-	mΩ
		I_D = 30A, V_{GS} = 4.5V	-	-	-	
		I_D = 30A, V_{GS} = 10V, T_J = 175°C	-	-	-	
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz	-	3150	-	pF
C_{OSS}	Output Capacitance		-	890	-	pF
C_{RSS}	Reverse Transfer Capacitance		-	441	-	pF
R_G	Gate Resistance	V_{GS} = 0V, V_{DS}=0V, f = 1MHz	-	1	-	Ω
$Q_{g(TOT)}$	Total Gate Charge at 10V	V_{GS} = 0V to 10V, V_{DD} = 15V, I_D = 20A, I_g = 1.0mA	-	158	-	nC
$Q_{g(5)}$	Total Gate Charge at 5V	V_{GS} = 0V to 5V	-	80	-	nC
$Q_{g(TH)}$	Threshold Gate Charge	V_{GS} = 0V to 1V	-	3.0	4.0	nC
Q_{gs}	Gate to Source Gate Charge		-	17	-	nC
Q_{gs2}	Gate Charge Threshold to Plateau		-	6.0	-	nC
Q_{gd}	Gate to Drain “Miller” Charge		-	31	-	nC
Switching Characteristics (V_{GS} = 10V)						
t_{ON}	Turn-On Time	V_{DD} = 15V, I_D = 30A, V_{GS} = 4.5V, R_{GS} = 4.7Ω	-	45	-	ns
$t_{d(ON)}$	Turn-On Delay Time		-	20	-	ns
t_r	Rise Time		-	20	-	ns
$t_{d(OFF)}$	Turn-Off Delay Time		-	80	-	ns
t_f	Fall Time		-	45	-	ns
t_{OFF}	Turn-Off Time		-	62	-	ns
Drain-Source Diode Characteristics						
V_{SD}	Source to Drain Diode Voltage	I_{SD} = 30A,	-	-	1.25	V
		I_{SD} = 30A,	-	-	1.0	V
t_{rr}	Reverse Recovery Time	I_{SD} = 30A, dI_{SD}/dt = 100A/μs	-	-	32	ns
Q_{RR}	Reverse Recovered Charge	I_{SD} = 30A, dI_{SD}/dt = 100A/μs	-	-	18	nC

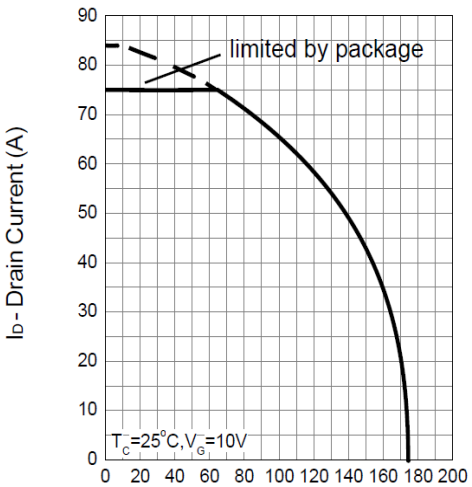
Notes:
1: Package current limitation is 80A.
2: Starting T_J = 25°C, L =0.5MH I_{AS} = 64A, V_{DD} = 37V, V_{GS} = 10V.
3: Pulse width = 100s.

Typical Operating Characteristics

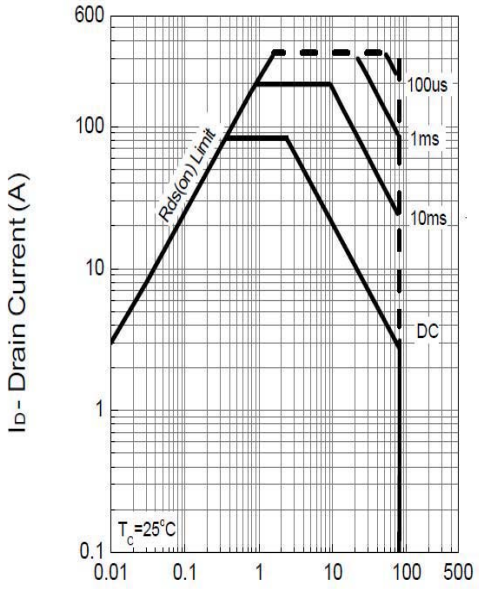
Power Dissipation



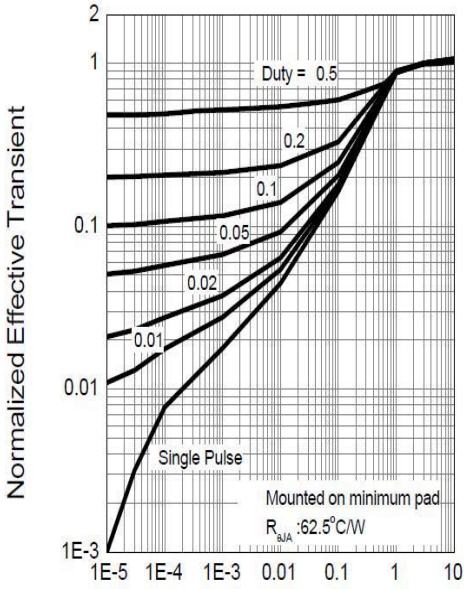
Drain Current



Safe Operation Area

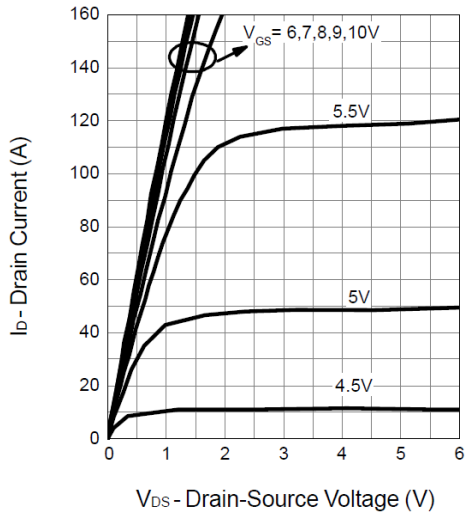


Thermal Transient Impedance

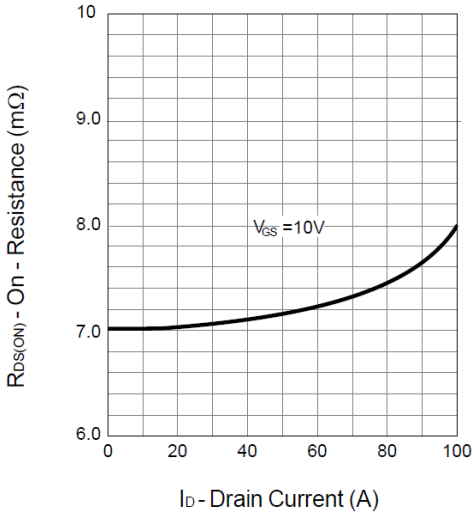


Typical Operating Characteristics (Cont.)

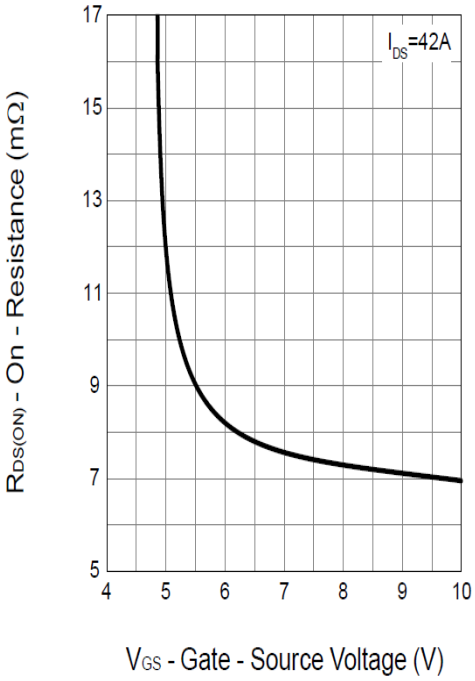
Output Characteristics



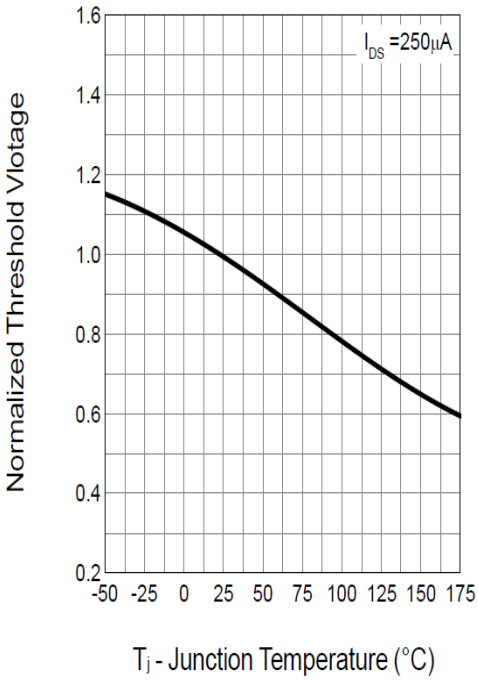
Drain-Source On Resistance



Drain-Source On Resistance

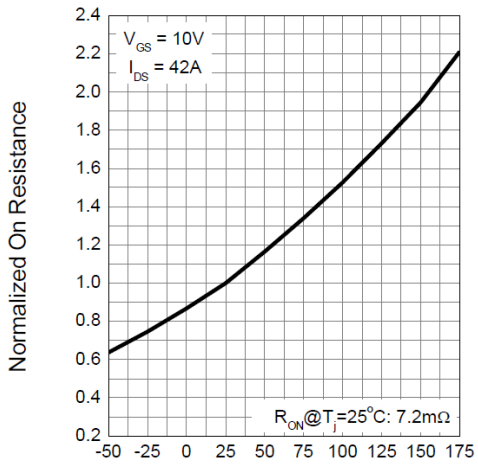


Gate Threshold Voltage

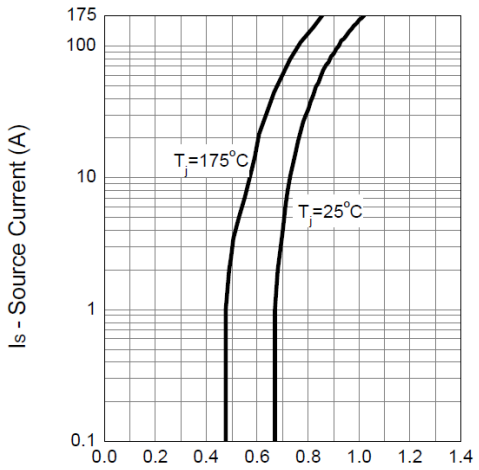


Typical Operating Characteristics (Cont.)

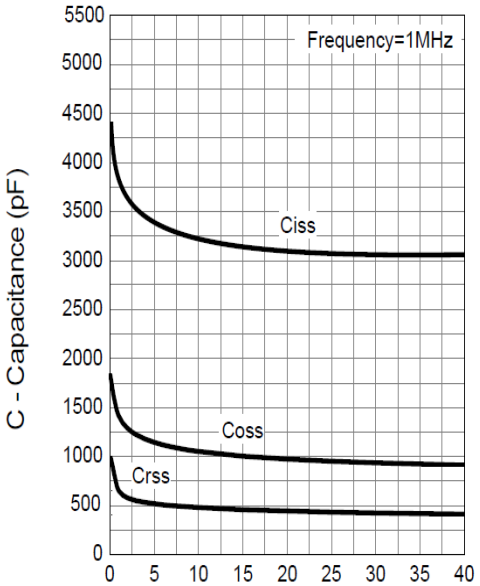
Drain-Source On Resistance



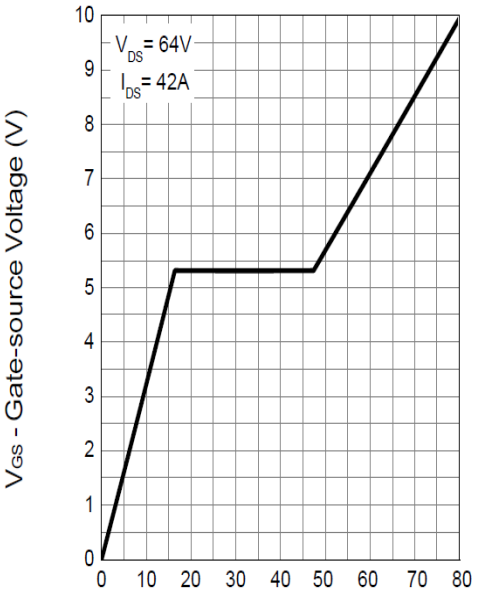
Source-Drain Diode Forward



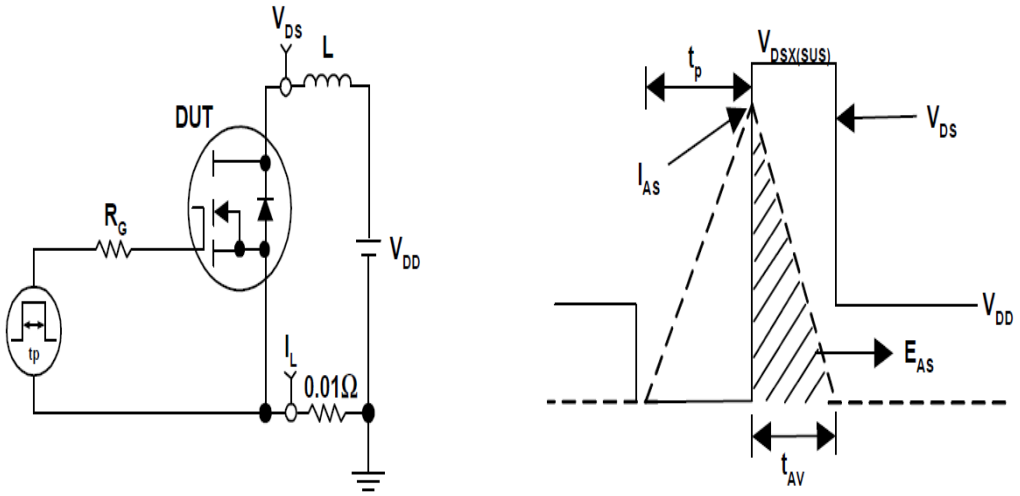
Capacitance



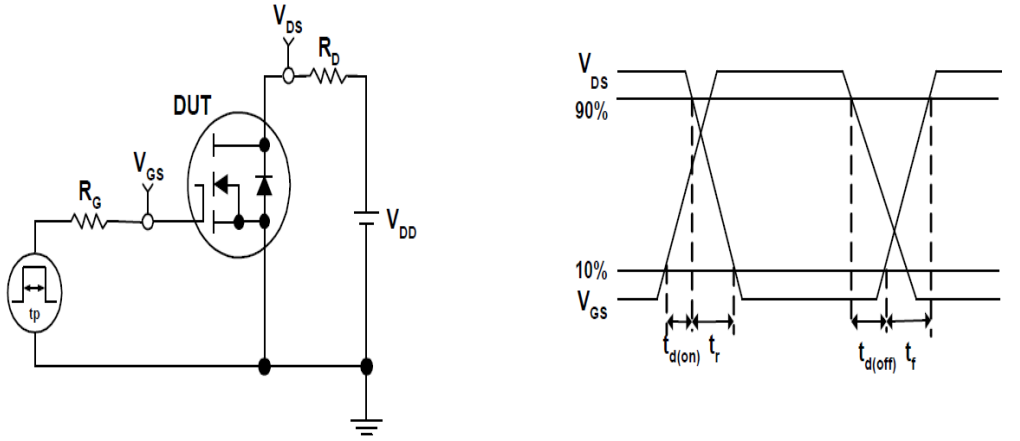
Gate Charge



Avalanche Test Circuit and Waveforms



Avalanche Test Circuit and Waveforms



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