

MT3243

N-Channel Enhancement Mode MOSFET

Feature Description

- 30V/140A
 $R_{DS(ON)}=2.0m\Omega(\text{typ.})@V_{GS}=10V$
 $R_{DS(ON)}=2.8m\Omega(\text{typ.})@V_{GS}=4.5V$
- 100% avalanche tested
- Excellent CdV/dt effect decline
- Halogen - Free Device Available

Applications

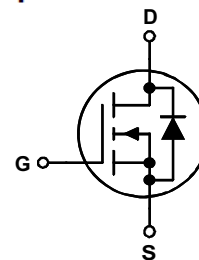
- Systems High Frequency Synchronous Buck Converters for Computer Processor Power
- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use



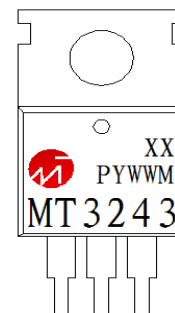
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Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



TO-220

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	V
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Drain Current-Continuous	Tc=25°C	140	A
Mounted on Large Heat Sink				
I _{DM}	Pulsed Drain Current *	Tc=25°C	560	A
I _D	Continuous Drain Current	Tc=25°C	140	A
		Tc=100°C	101	A
P _D	Maximum Power Dissipation	Tc=25°C	115	W
		Tc=100°C	57.5	W
R _{θJC}	Thermal Resistance, Junction-to-Case		1.3	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient **		62.5	°C/W
E _{AS}	Single Pulsed-Avalanche Energy ***	L=0.3mH	186	mJ

Note: * Repetitive rating ; pulse width limited by max junction temperature.
 ** Surface mounted on FR-4 board.
 *** Limited by T_{Jmax} , starting $T_J=25^{\circ}C$, $L = 0.3mH$, $R_G = 25\Omega$, $V_{GS}=10V$.

Electrical Characteristics ($T_C = 25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions					Unit
				Min	Typ	Max	
Static Characteristics							
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA		30	-	-	V
I _{DSS}	Drain-to-Source LeakageCurrent	V _{DS} =30V, V _{GS} =0V		-	-	1	uA
			T _J =55°C	-	-	5	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA		1	1.5	3	V
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0V		-	-	±100	nA
R _{DS(ON)} *	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =70A		-	2.0	2.5	mΩ
		V _{GS} =4.5V, I _{DS} =70A		-	2.8	3.2	mΩ
Diode Characteristics							
V _{SD} *	Diode Forward Voltage	I _{SD} =70A, V _{GS} =0V		-	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =70A, dI _{SD} /dt=100A/us		-	23	-	ns
Q _{rr}	Reverse Recovery Charge			-	58	-	nC

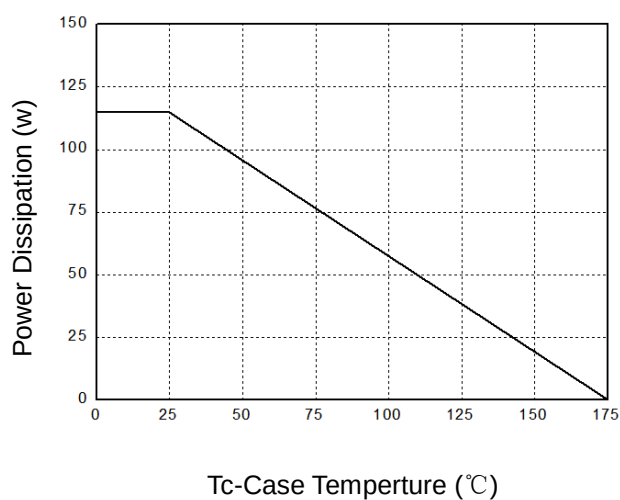
Electrical Characteristics (Cont.) ($T_C = 25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions				Unit
			Min	Typ	Max	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1 MHz	-	1.9	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V,	-	6000	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V,	-	469	-	
C _{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz	-	322	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _G =4Ω, I _{DS} =70A, V _{GS} =10V	-	13	-	ns
T _r	Turn-on Rise Time		-	11	-	
t _{d(OFF)}	Turn-off Delay Time		-	41	-	
T _f	Turn-off Fall Time		-	14	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =24V, V _{GS} =10V, I _D =70A,	-	120	-	nC
Q _{gs}	Gate-Source Charge		-	9	-	
Q _{gd}	Gate-Drain Charge		-	26	-	

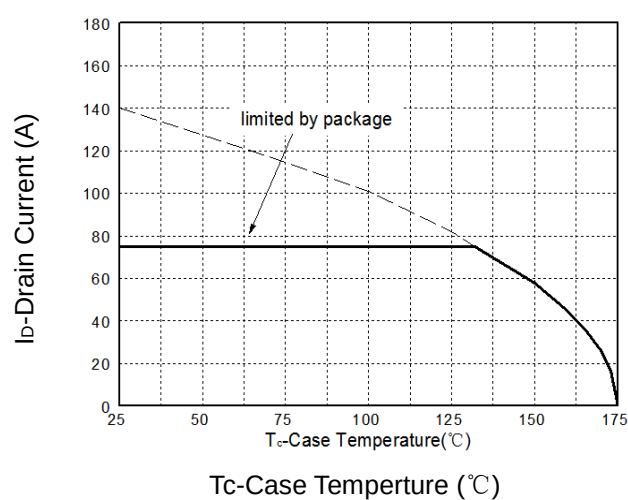
Note: *Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

Typical Operating Characteristics

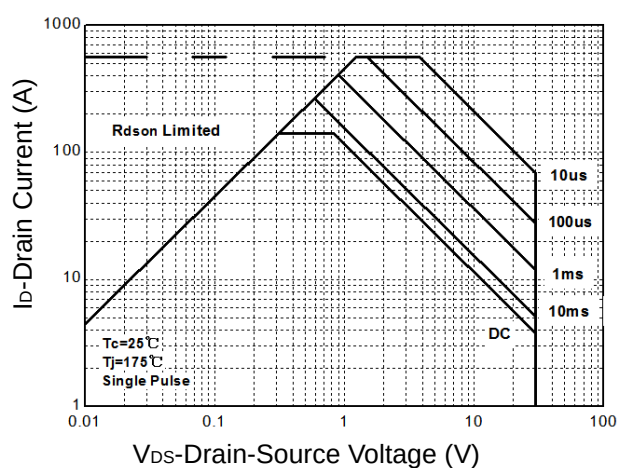
Power Dissipation



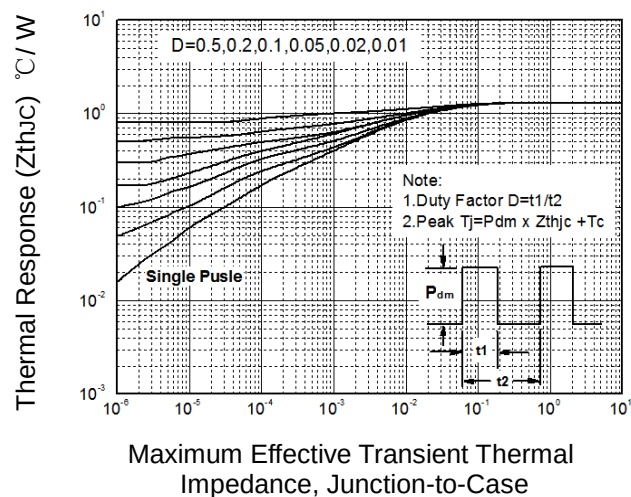
Drain Current



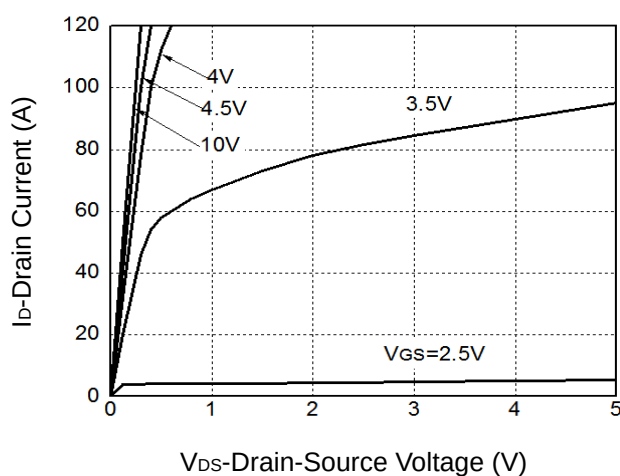
Safe Operation Area



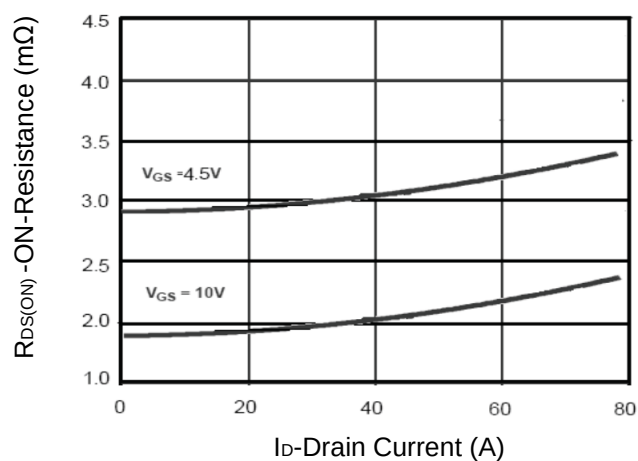
Thermal Transient Impedance



Output Characteristics

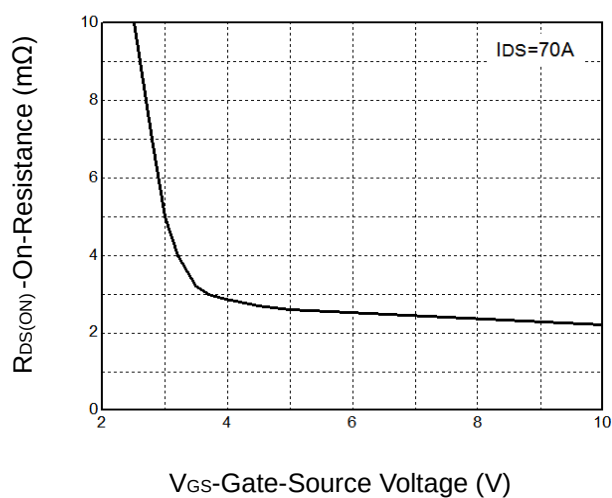


Drain-Source On Resistance

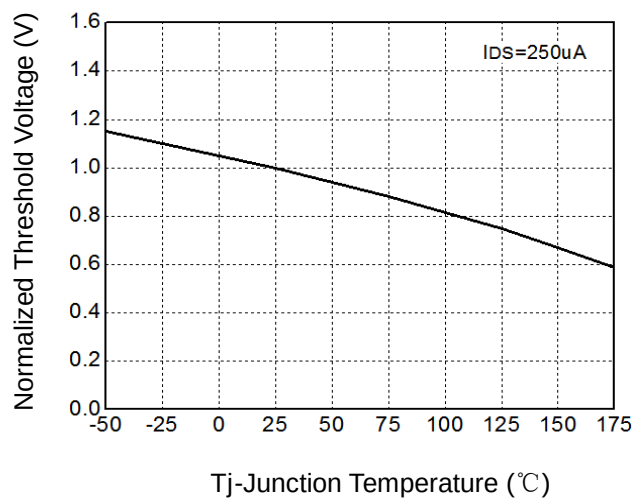


Typical Operating Characteristics(Cont.)

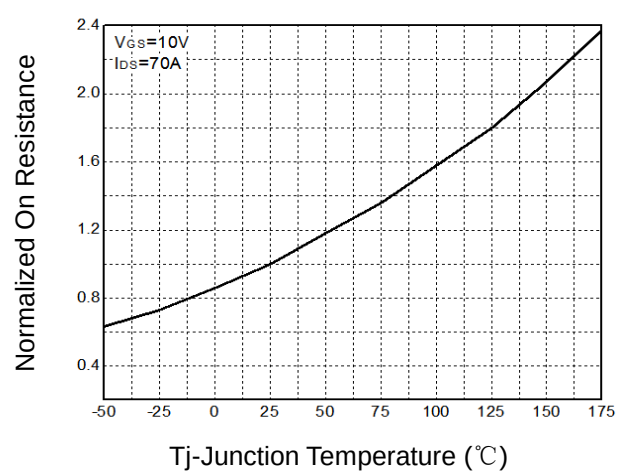
Gate-Source On Resistance



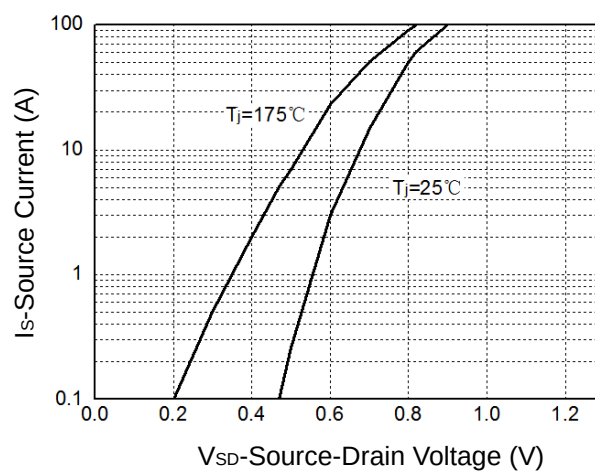
Gate Threshold Voltage



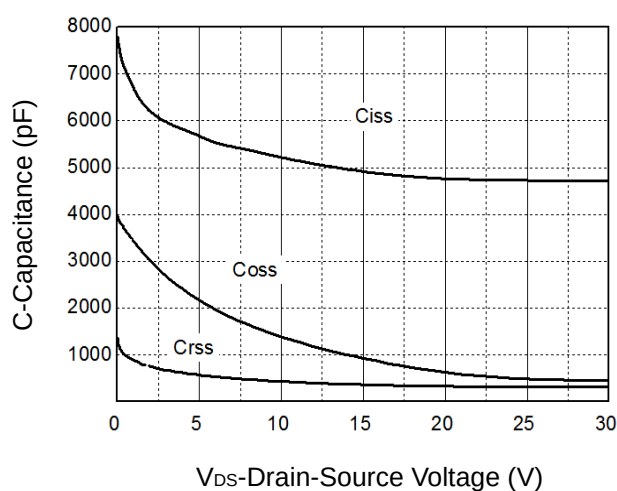
On-Resistance vs. Temperature



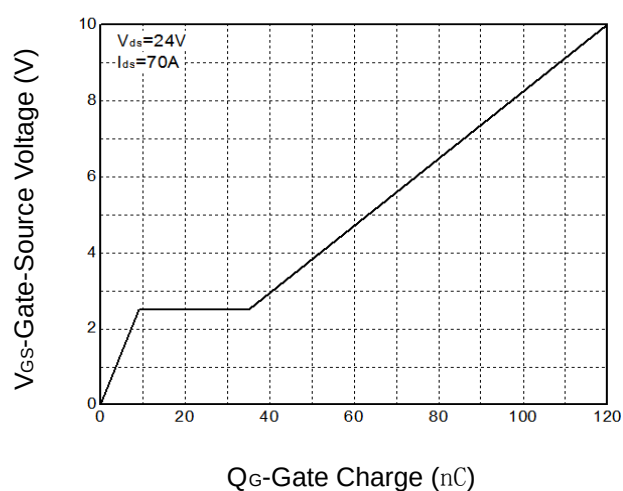
Source- Drain Diode Forward



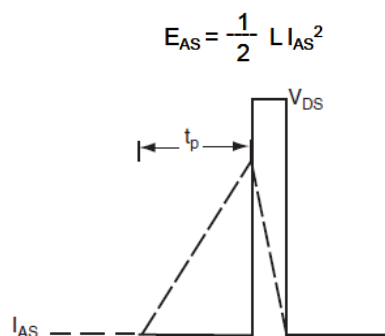
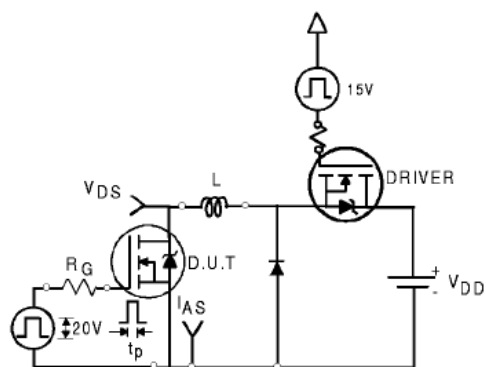
Capacitance Characteristics



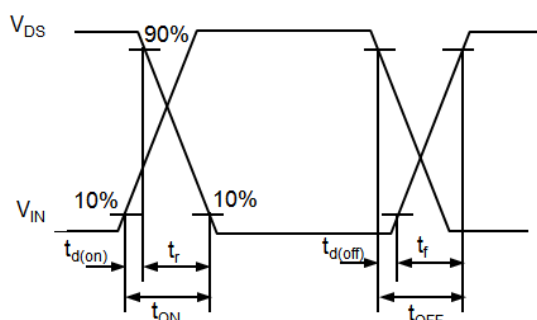
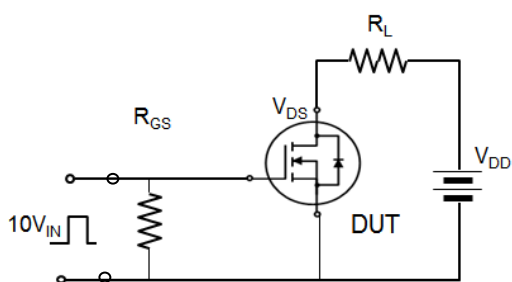
Gate Charge Characteristics



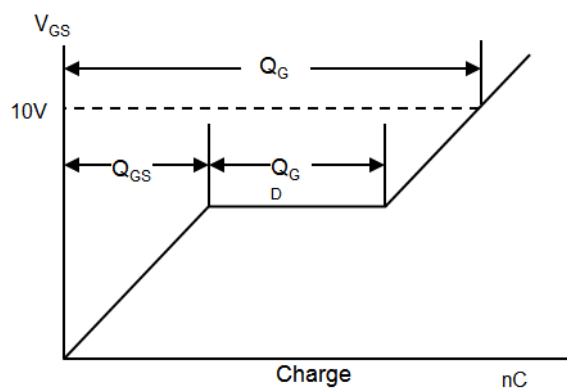
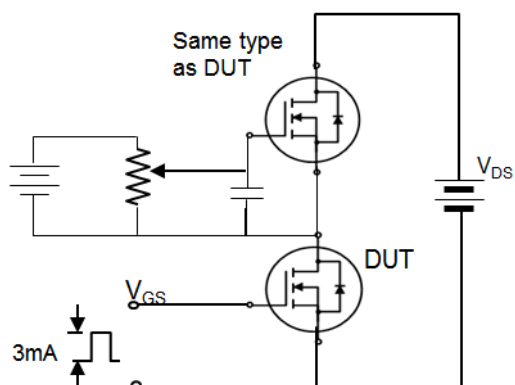
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

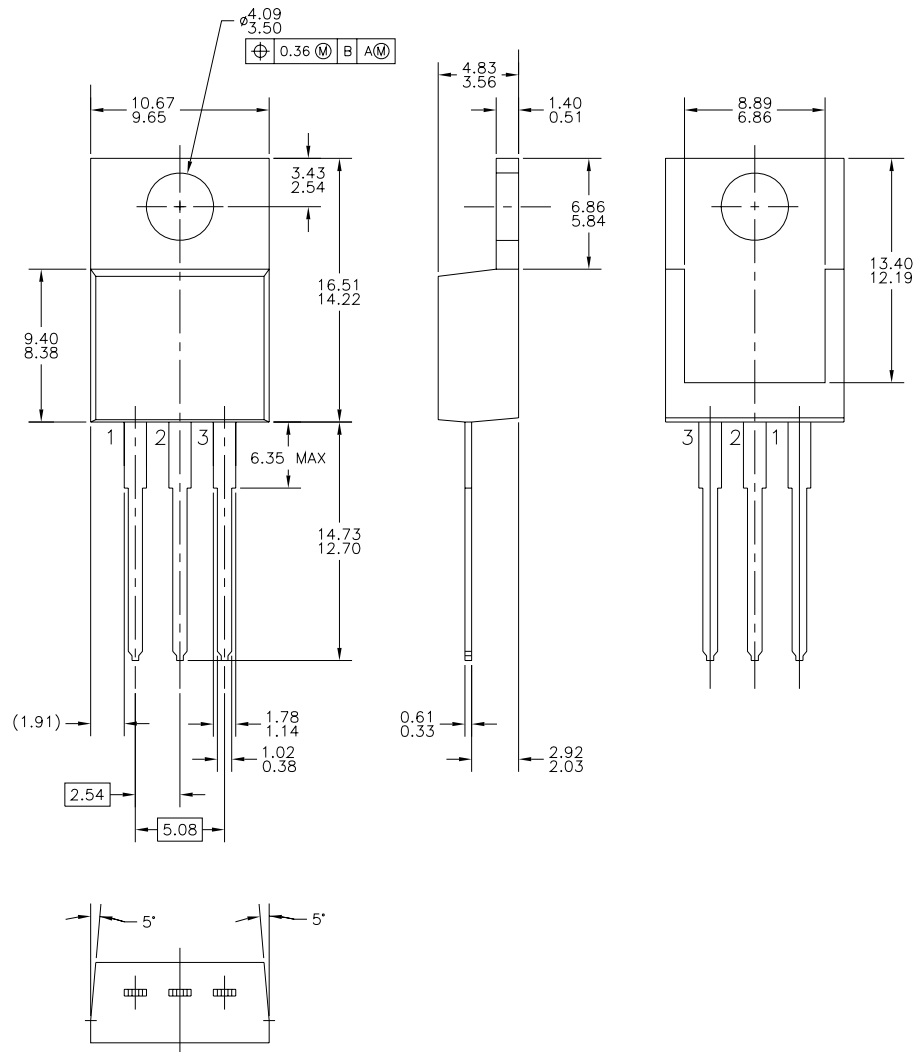


Gate Charge Test Circuit and Waveforms



Mechanical Dimensions

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