

## Lonten N-channel 150V, 120A, 8.5mΩ Power MOSFET

### Features

- ◆ 150V, 120 A,  $R_{DS(ON),max}=8.5\text{ m}\Omega @ V_{GS}=10\text{V}$
- ◆ Improved dv/dt capability
- ◆ Fast switching
- ◆ 100% EAS Guaranteed
- ◆ Green device available

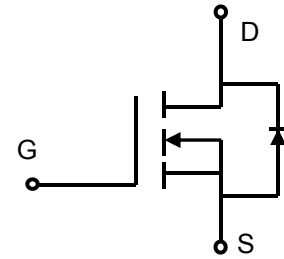
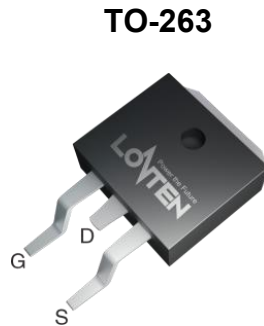
### Applications

- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

### Product Summary

$V_{DS}$	150V
$R_{DS(on)}$	7mΩ
$I_D$	120A

*100% Avalanche Tested*



### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	150	V
Continuous drain current	$I_D$	$T_C = 25^\circ\text{C}$ (Silicon limit)	128
$T_C = 25^\circ\text{C}$ (Package limit)		120	
$T_C = 100^\circ\text{C}$ (Silicon limit)		81	
Pulsed drain current ( $T_C = 25^\circ\text{C}$ , $t_p$ limited by $T_{jmax}$ )	$I_{D\ pulse}$	480	A
Avalanche energy, single pulse ( $L=0.5\text{mH}$ , $R_g=25\Omega$ )	$E_{AS(\text{Note } 1)}$	625	mJ
Gate-Source voltage	$V_{GS}$	$\pm 20$	V
Power dissipation ( $T_C = 25^\circ\text{C}$ )	$P_{tot}$	227	W
Operating junction and storage temperature	$T_j, T_{stg}$	-55...+175	$^\circ\text{C}$

※. Notes: 1. EAS is tested at starting  $T_j = 25^\circ\text{C}$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = 50\text{A}$ ,  $V_{GS} = 10\text{V}$ .

## Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	$R_{thJC}$	0.52	°C/W
Thermal resistance, junction – ambient(min. footprint)	$R_{thJA}$	60	

## Electrical Characteristic (at $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

## Static Characteristic

Drain-source breakdown voltage	$BV_{DSS}$	150	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	2	3	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=150V, V_{GS}=0V$ $T_j=25^\circ C$ <b><math>T_j=125^\circ C</math></b>
Gate-source leakage current	$I_{GSS}$	-	-	100	nA	$V_{GS}=20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	7.0	8.5	$m\Omega$	$V_{GS}=10V, I_D=50A$ TO-220 TO-263
		-	7.0	8.5		
Transconductance	$g_{fs}$	-	91.8	-	S	$V_{DS}=5V, I_D=50A$

## Dynamic Characteristic

Input Capacitance	$C_{iss}$	-	4217	-	$\mu F$	$V_{GS}=0V, V_{DS}=75V,$ $f=1MHz$
Output Capacitance	$C_{oss}$	-	512	-		
Reverse Transfer Capacitance	$C_{rss}$	-	15	-		
Gate Total Charge	$Q_G$	-	63	-	nC	$V_{GS}=10V, V_{DS}=75V,$ $I_D=50A, f=1MHz$
Gate-Source charge	$Q_{gs}$	-	21	-		
Gate-Drain charge	$Q_{gd}$	-	15	-		
Turn-on delay time	$t_{d(on)}$	-	11	-	ns	$V_{ds}=75V$ $I_d=100A$ $R_g=2.7\Omega$ $V_{gs}=10V;$ (Note 2,3)
Rise time	$t_r$	-	107	-		
Turn-off delay time	$t_{d(off)}$	-	54	-		
Fall time	$t_f$	-	102	-		
Gate resistance	$R_G$	-	3.0	-	$\Omega$	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$

## Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	$V_{SD}$	-	0.86	1.4	V	$V_{GS}=0V, I_{SD}=50A$
Body Diode Reverse Recovery Time	$t_{rr}$	-	100	-	ns	$I_{SD}=100A, V_{GS}=0V, dI_F/dt=100A/us;$
Body Diode Reverse Recovery Charge	$Q_{rr}$	-	451	-	nC	

※. Notes

2.Pulse Test : Pulse Width  $\leq 300us$ , duty cycle  $\leq 2\%$ .

3.Essentially independent of operating temperature.

Typical Performance Characteristics

Fig 1: Output Characteristics

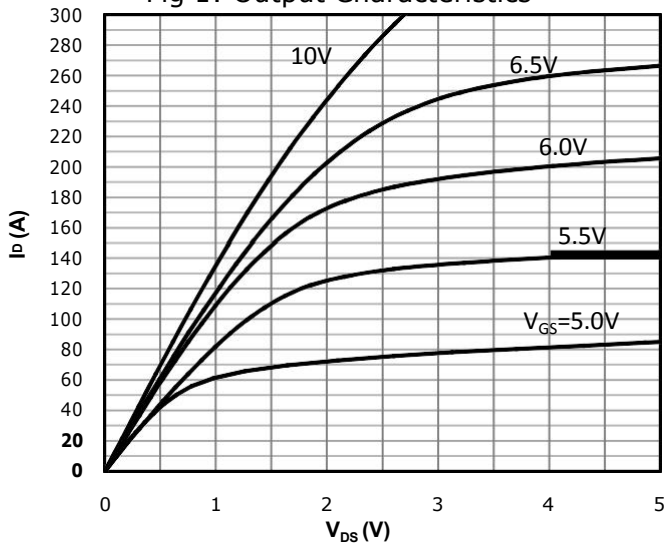


Fig 2: Transfer Characteristics

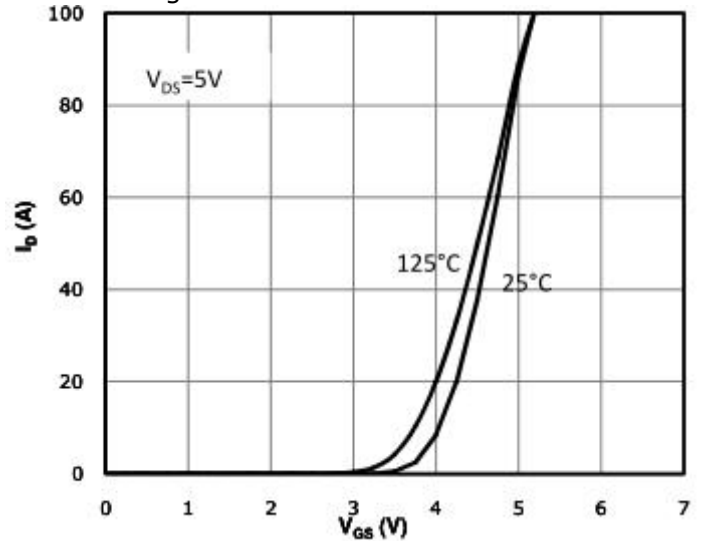


Fig 3:  $R_{DS(on)}$  vs Drain Current and Gate Voltage

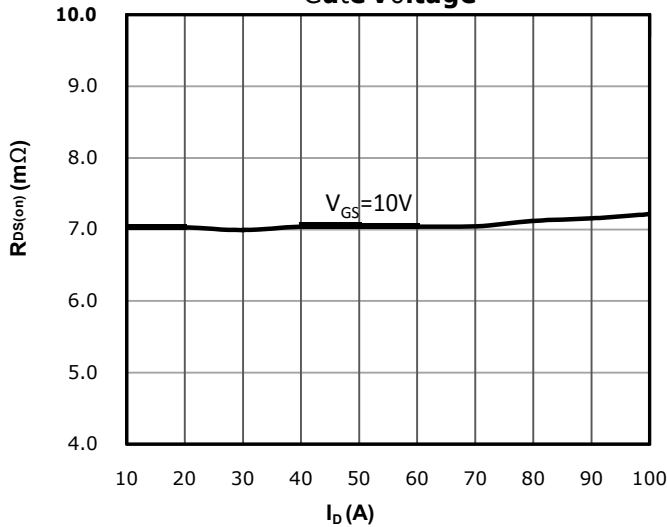


Fig 4:  $R_{DS(on)}$  vs Gate Voltage

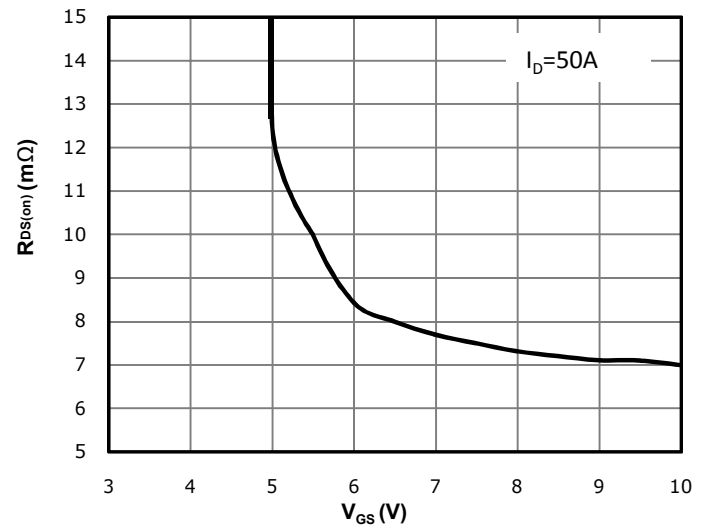


Fig 5:  $R_{DS(on)}$  vs. Temperature

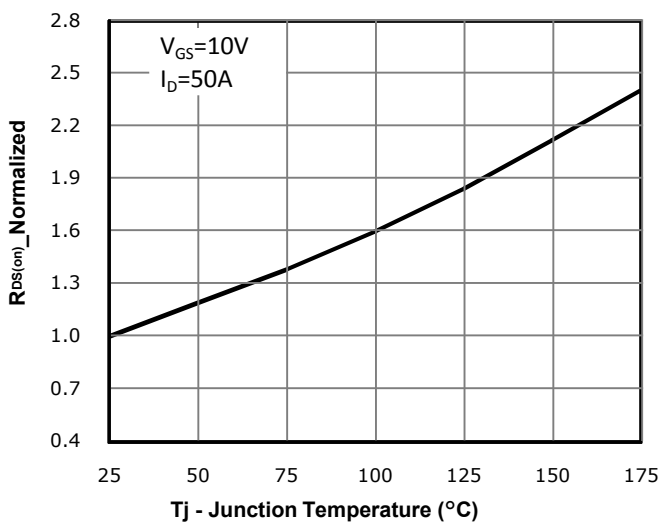


Fig 6: Capacitance Characteristics

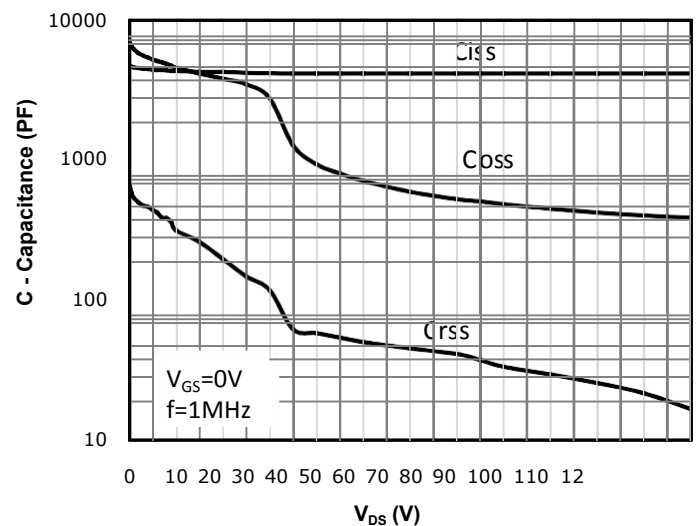


Fig 7: Gate Charge Characteristics

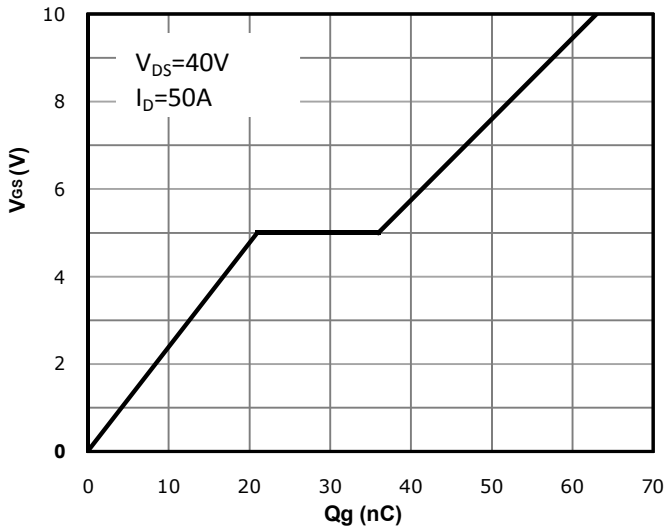


Fig 8: Body-diode Forward Characteristics

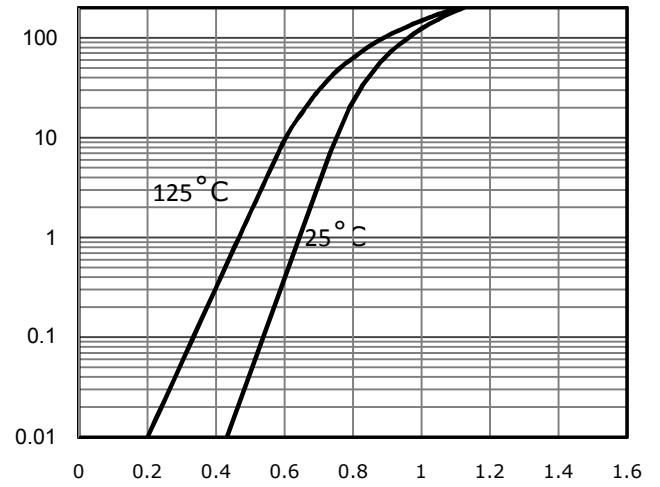


Fig 9: Power Dissipation

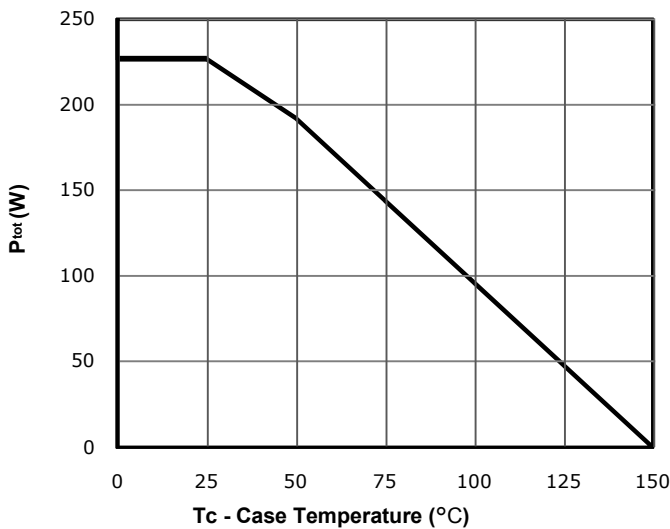


Fig 10: Drain Current Derating

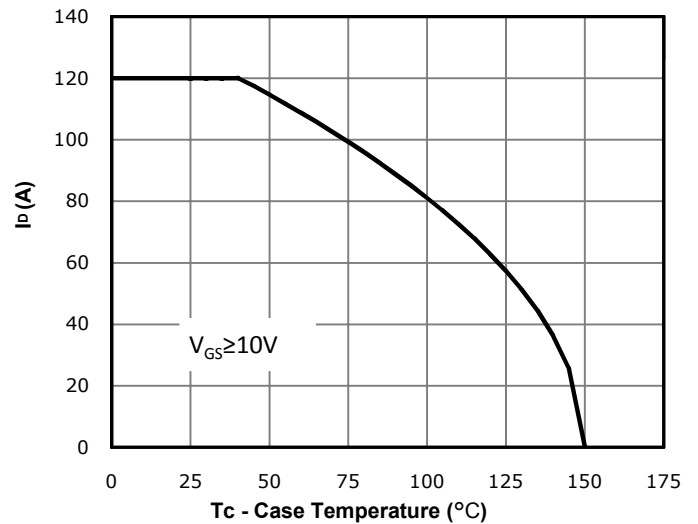
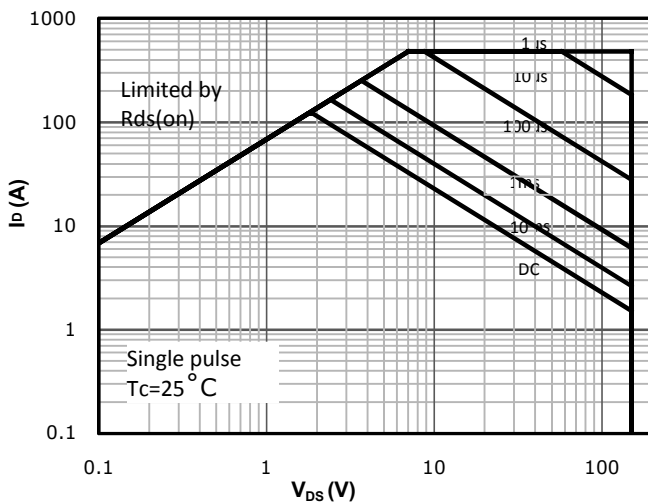
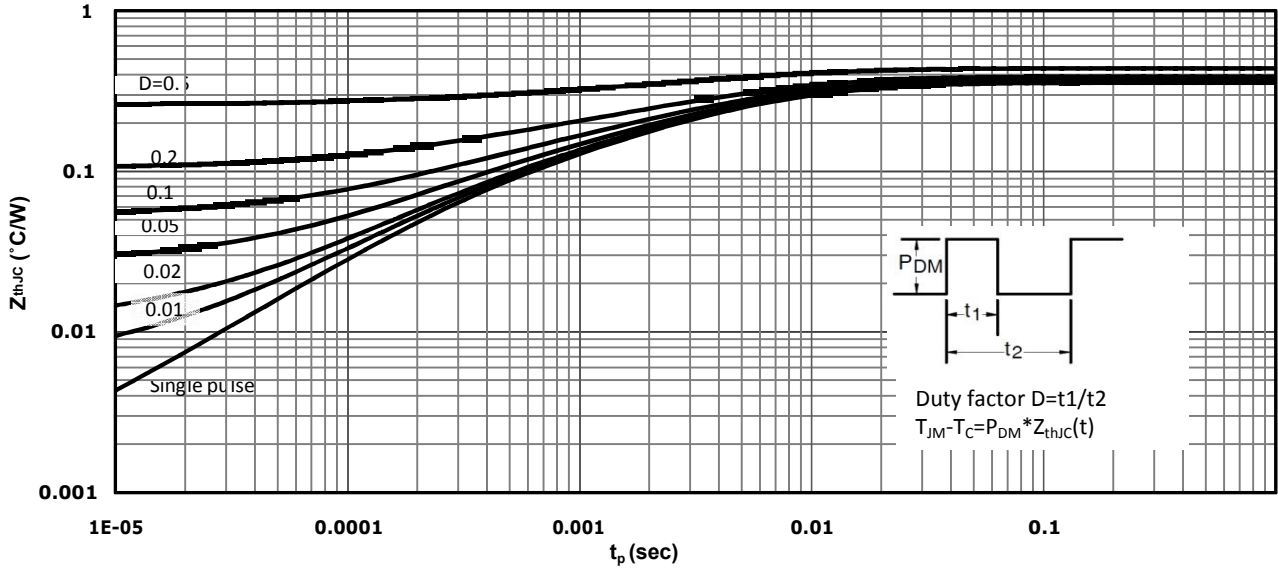


Fig 11: Safe Operating Area

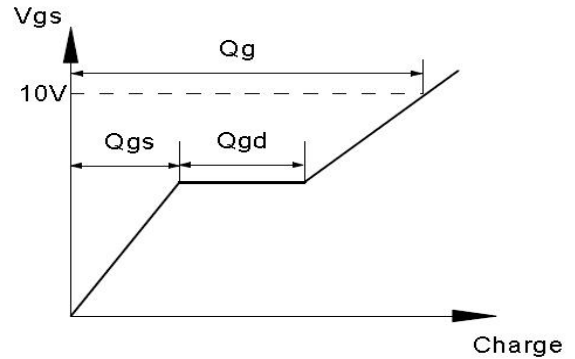
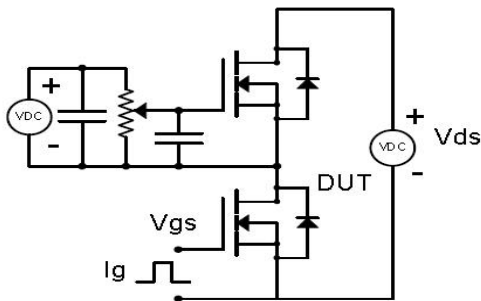


**Fig 12: Max. Transient Thermal Impedance**

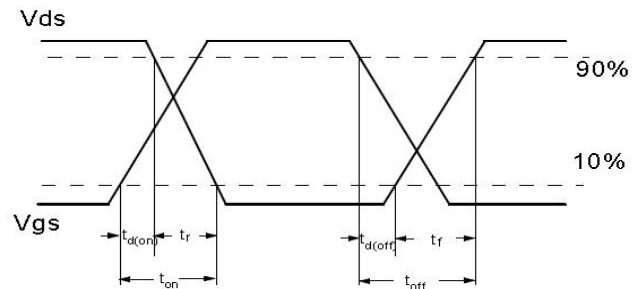
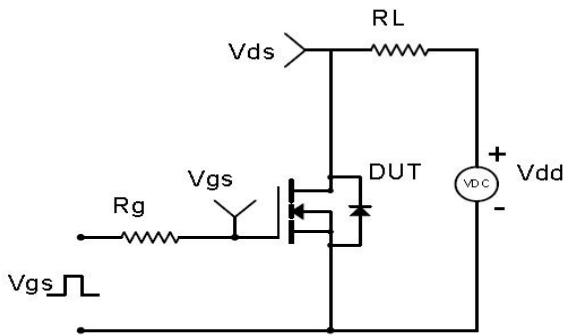


Test Circuit & Waveform

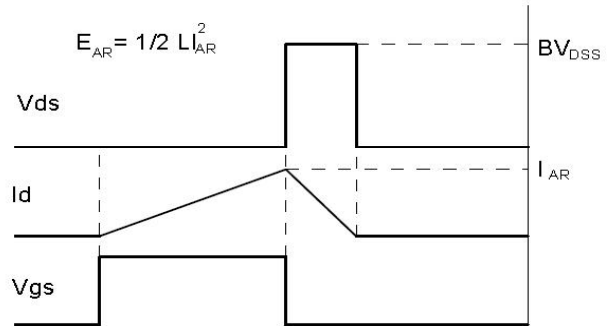
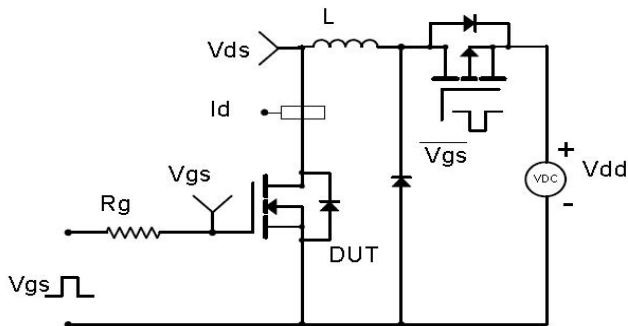
Gate Charge Test Circuit & Waveform



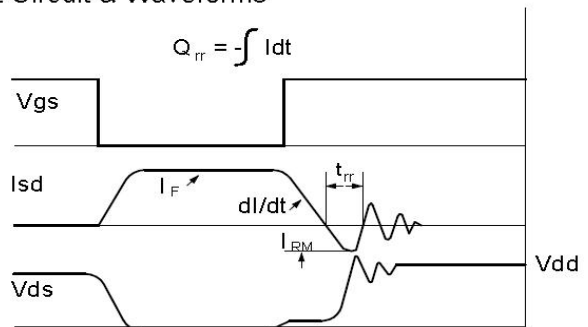
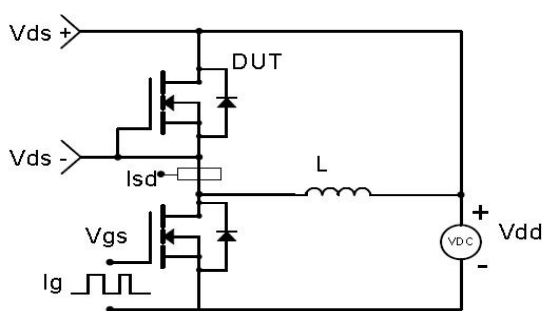
Resistive Switching Test Circuit & Waveforms



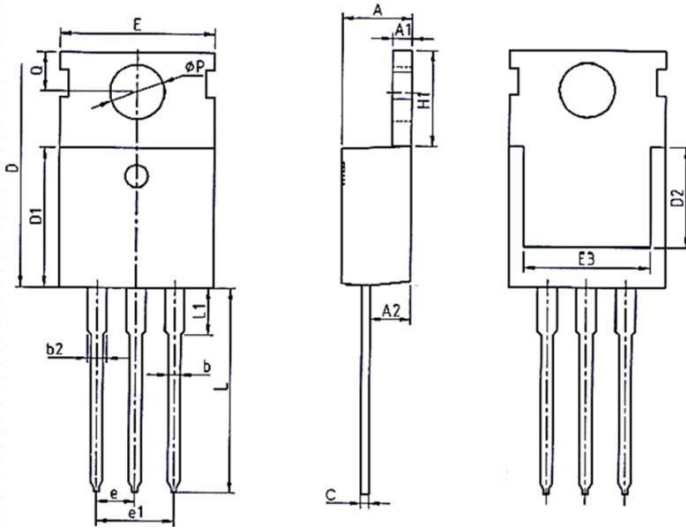
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

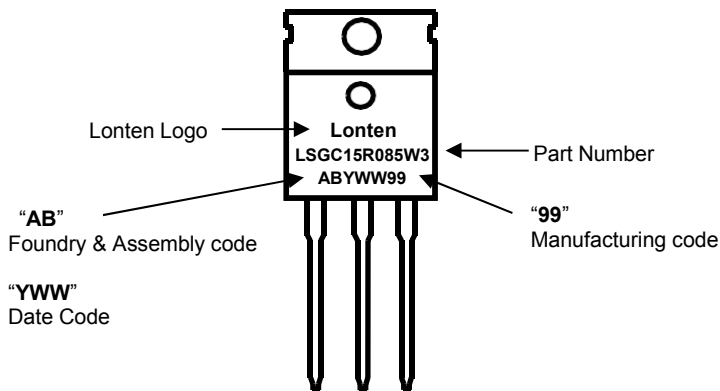


**Mechanical Dimensions for TO-220**



COMMON DIMENSIONS						
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.37	4.57	4.70	0.172	0.180	0.185
A1	1.25	1.30	1.40	0.049	0.051	0.055
A2	2.20	2.40	2.60	0.087	0.094	0.102
b	0.70	0.80	0.95	0.028	0.031	0.037
b2	1.17	1.27	1.47	0.046	0.050	0.058
c	0.45	0.50	0.60	0.018	0.020	0.024
D	15.10	15.60	16.10	0.594	0.614	0.634
D1	8.80	9.10	9.40	0.346	0.358	0.370
D2	5.50	-	-	0.217	-	-
E	9.70	10.00	10.30	0.382	0.394	0.406
E3	7.00	-	-	0.276	-	-
e	2.54BCS			0.1BSC		
e1	5.08BCS			0.2REF		
H1	6.25	6.50	6.85	0.246	0.256	0.270
L	12.75	13.50	13.80	0.502	0.531	0.543
L1	-	3.10	3.40	-	0.122	0.134
ØP	3.40	3.60	3.80	0.134	0.142	0.150
Q	2.60	2.80	3.00	0.102	0.110	0.118

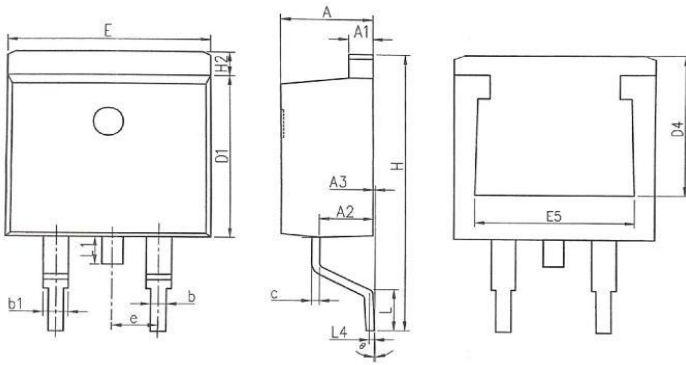
**TO-220 Part Marking Information**



Calendar Year	Year Code	Calendar Week	Week Code
2019	H	Workweek 02	02
2020	I	Workweek 03	03
2021	J	Workweek 04	04
2022	K	Workweek 05	05
2023	L	Workweek 06	06
2024	M	.....	.....

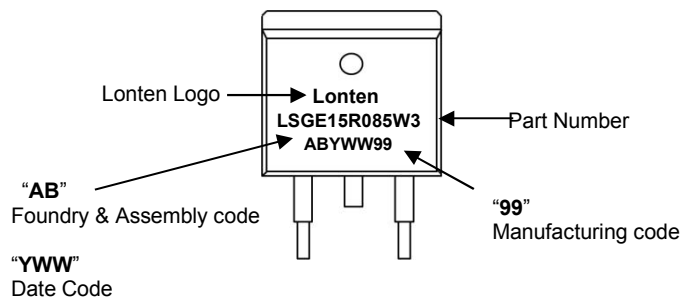


**Mechanical Dimensions for TO-263**



COMMON DIMENSIONS						
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.37	4.57	4.77	0.172	0.180	0.188
A1	1.22	1.27	1.42	0.048	0.050	0.056
A2	2.49	2.69	2.89	0.098	0.106	0.114
A3	0.00	0.13	0.25	0.000	0.005	0.010
b	0.70	0.81	0.96	0.028	0.032	0.038
b1	1.17	1.27	1.47	0.046	0.050	0.058
c	0.30	0.38	0.53	0.012	0.015	0.021
D1	8.50	8.70	8.90	0.335	0.343	0.350
D4	6.60	—	—	0.260	—	—
E	9.86	10.16	10.36	0.388	0.400	0.408
E5	7.06	—	—	0.278	—	—
e	2.54 BSC			0.100 BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.07	1.27	1.47	0.042	0.050	0.058
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.40	1.55	1.70	0.055	0.061	0.067
L4	0.25 BSC			0.010 BSC		
θ	0°	5°	9°	0°	5°	9°

**TO-263 Part Marking Information**



Calendar Year	Year Code	Calendar Week	Week Code
2019	H	Workweek 02	02
2020	I	Workweek 03	03
2021	J	Workweek 04	04
2022	K	Workweek 05	05
2023	L	Workweek 06	06
2024	M	.....	.....

**Disclaimer**

The content specified herein is for the purpose of introducing LONTEN's products (hereinafter "Products"). The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

LONTEN does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of the Products or technical information described in this document.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). LONTEN shall bear no responsibility in any way for use of any of the Products for the above special purposes.

Although LONTEN endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a LONTEN product.

The content specified herein is subject to change for improvement without notice. When using a LONTEN product, be sure to obtain the latest specifications.

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [LONTEN](#) manufacturer:*

Other Similar products are found below :

[614233C](#) [648584F](#) [MCH3443-TL-E](#) [MCH6422-TL-E](#) [FDPF9N50NZ](#) [FW216A-TL-2W](#) [FW231A-TL-E](#) [APT5010JVR](#) [NTNS3A92PZT5G](#)  
[IRF100S201](#) [JANTX2N5237](#) [2SK2464-TL-E](#) [2SK3818-DL-E](#) [FCA20N60\\_F109](#) [FDZ595PZ](#) [STD6600NT4G](#) [FSS804-TL-E](#) [2SJ277-DL-E](#)  
[2SK1691-DL-E](#) [2SK2545\(Q,T\)](#) [D2294UK](#) [405094E](#) [423220D](#) [MCH6646-TL-E](#) [TPCC8103,L1Q\(CM](#) [367-8430-0972-503](#) [VN1206L](#)  
[424134F](#) [026935X](#) [051075F](#) [SBVS138LT1G](#) [614234A](#) [715780A](#) [NTNS3166NZT5G](#) [751625C](#) [873612G](#) [IRF7380TRHR](#)  
[IPS70R2K0CEAKMA1](#) [RJK60S3DPP-E0#T2](#) [RJK60S5DPK-M0#T0](#) [APT5010JVFR](#) [APT12031JFLL](#) [APT12040JVR](#) [DMN3404LQ-7](#)  
[NTE6400](#) [JANTX2N6796U](#) [JANTX2N6784U](#) [JANTXV2N5416U4](#) [SQM110N05-06L-GE3](#) [SIHF35N60E-GE3](#)