

### FEATURES

- $R_{DS(ON)} < 6.5m\Omega @ V_{GS}=10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.

### MECHANICAL DATA

- Case: TO-220 TO-263 Package

### Ordering Information

Part No.	Package Type	Package	Quality(box)
D150N10	TO-220	Tube	1000
D150N10D	TO-263	Tape&Reel	800

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
100	6.5@ $V_{GS}=10V$	150

TO-220  
D150N10



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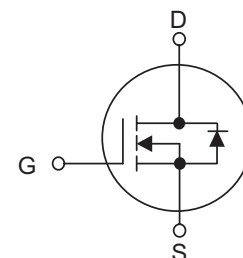
TO-263  
D150N10D



Pin Definition:

1. Gate
2. Drain
3. Source

### Block Diagram



### 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	$V_{GSS}$	$\pm 25$	V
Continuous Drain Current	$I_D$	150	A
Pulsed Drain Current (NOTE 1)	$I_{DM}$	530	A
Avalanche Energy(NOTE 2)	$E_{AS}$	560	mJ
Power Dissipation	$P_D$	215	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.  $L=0.5mH, I_D=66A, V_{DD}=90V, \text{Starting } T_J=25\text{ C}$

# D150N10 D150N10D

## 100V N-Channel Power MOSFET

### THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	$\theta_{JA}$	75	C/W
Junction to Case	$\theta_{JC}$	0.7	C/W

### ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25 C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250 $\mu$ A	100			V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	$\mu$ A
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>			100	nA
	Reverse				-100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 $\mu$ A	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		4.8	6.5	m $\Omega$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance (4)	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz		6235		pF
Output Capacitance(4)	C <sub>OSS</sub>			942		pF
Reverse Transfer Capacitance(4)	C <sub>RSS</sub>			506		pF
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time (4)	t <sub>D(ON)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V R <sub>G</sub> =25 $\Omega$		51		ns
Turn-On Rise Time(4)	t <sub>R</sub>			116		ns
Turn-Off Delay Time(4)	t <sub>D(OFF)</sub>			247		ns
Turn-Off Fall Time (4)	t <sub>F</sub>			150		ns
Total Gate Charge(4)	Q <sub>G</sub>	V <sub>DD</sub> =80V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V		120		nC
Gate-Source Charge(4)	Q <sub>GS</sub>			16		nC
Gate-Drain Charge(4)	Q <sub>GD</sub>			28		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Drain-Source Diode Forward Voltage (3)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =30A			1.3	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =60A DI <sub>F</sub> /dt=100A/ $\mu$ s		65		ns
Reverse Recovery Charge	Q <sub>rr</sub>			102		nC
Grid Resistance(4)	R <sub>G</sub>	V <sub>DD</sub> =0V, V <sub>GS</sub> =0V, F=1MHz		1.8		$\Omega$

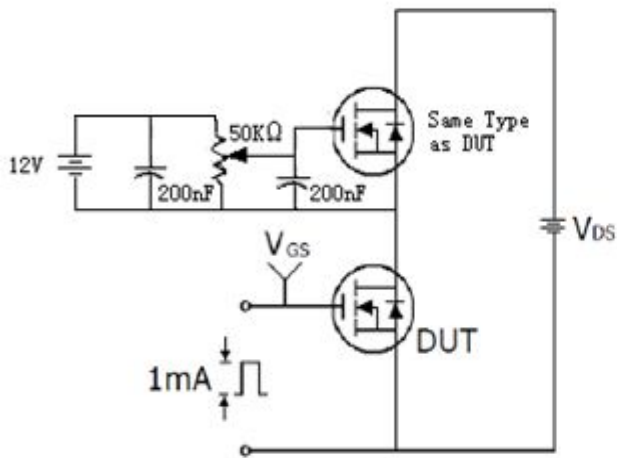
Notes: 3. Pulse Test: Pulse width  $\leq$ 300 $\mu$ s, Duty cycle $\leq$ 2%.

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

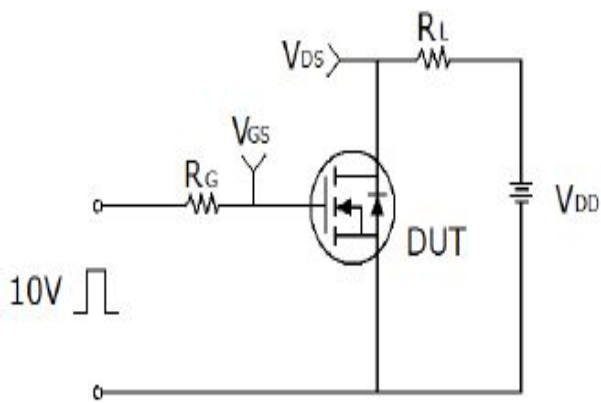
# D150N10 D150N10D

## 100V N-Channel Power MOSFET

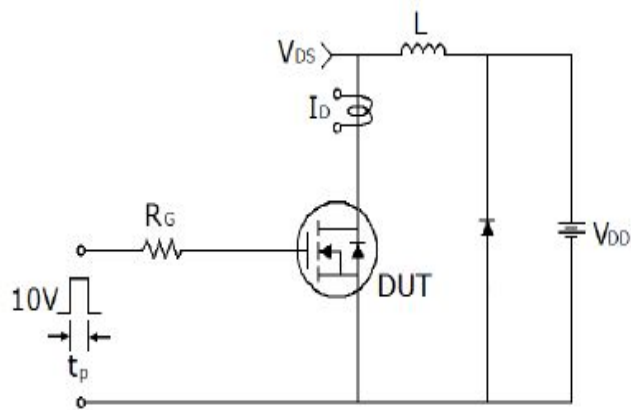
TEST CIRCUITS AND WAVEFORMS



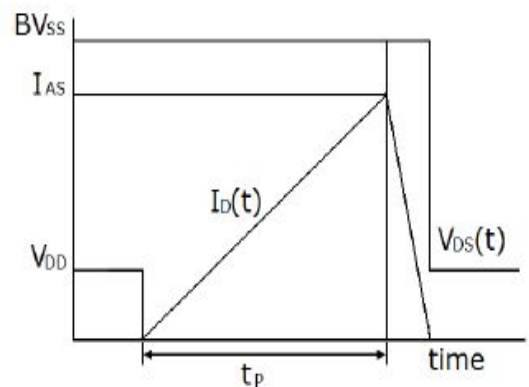
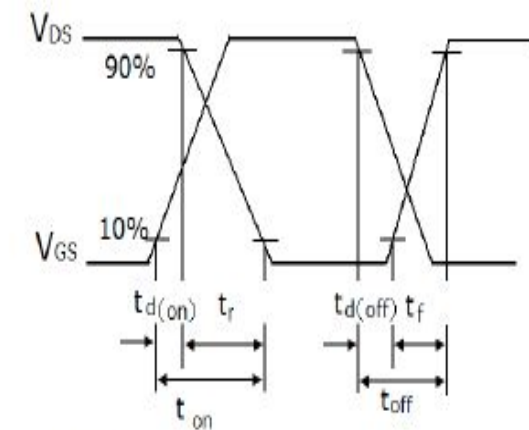
1) Gate charge test circuit & Waveform



2) Switch Time Test Circuit:



3) Unclamped Inductive Switching Test Circuit & Waveforms

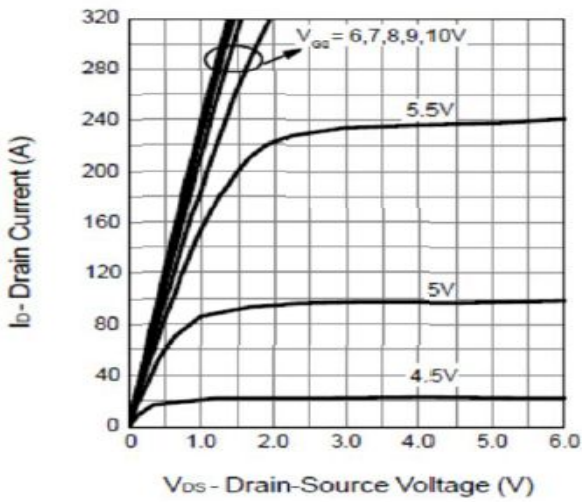


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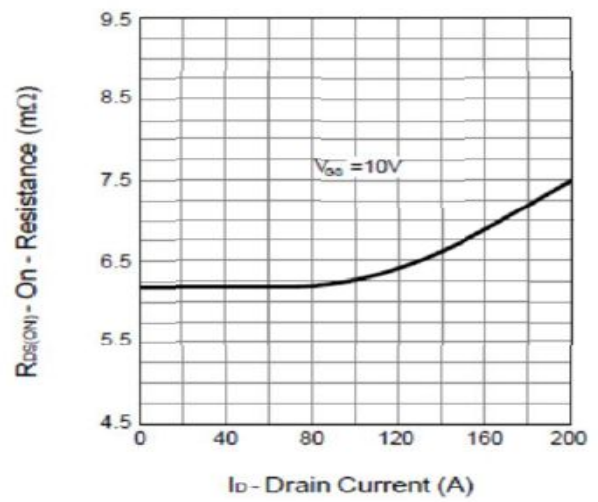
## 100V N-Channel Power MOSFET

### TYPICAL CHARACTERISTICS

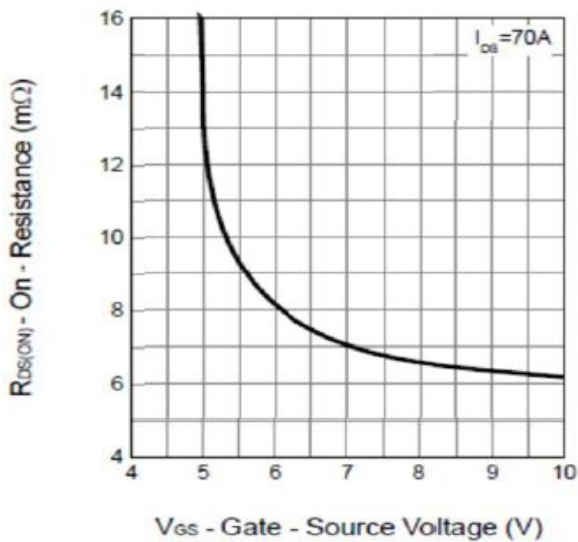
**Output Characteristics**



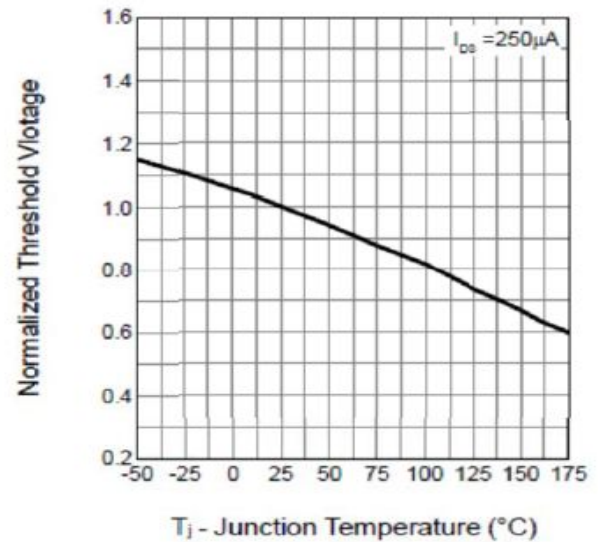
**Drain-Source On Resistance**



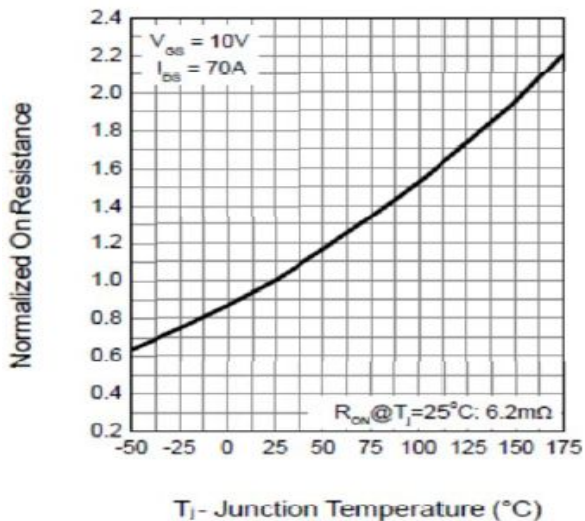
**Drain-Source On Resistance**



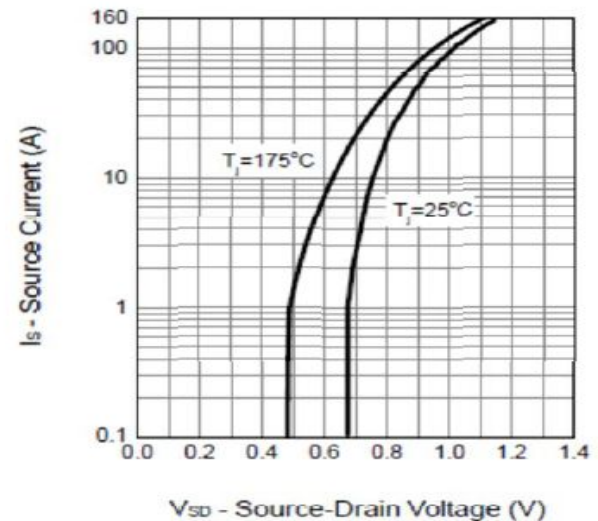
**Gate Threshold Voltage**



**Drain-Source On Resistance**



**Source-Drain Diode Forward**

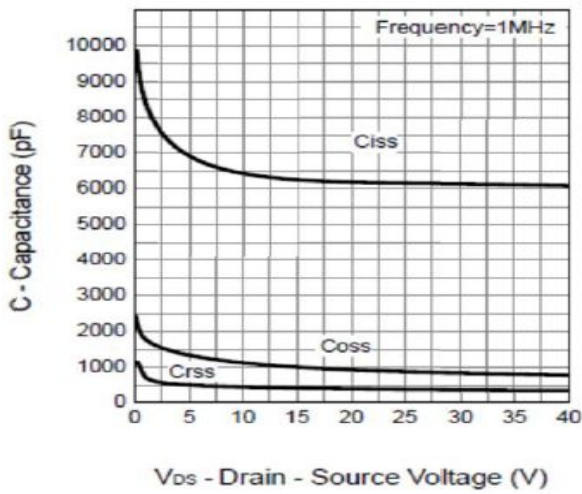


# D150N10 D150N10D

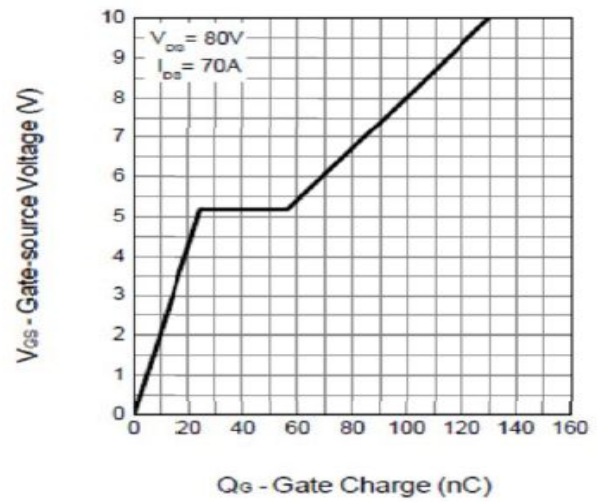
## 100V N-Channel Power MOSFET

### TYPICAL CHARACTERISTICS

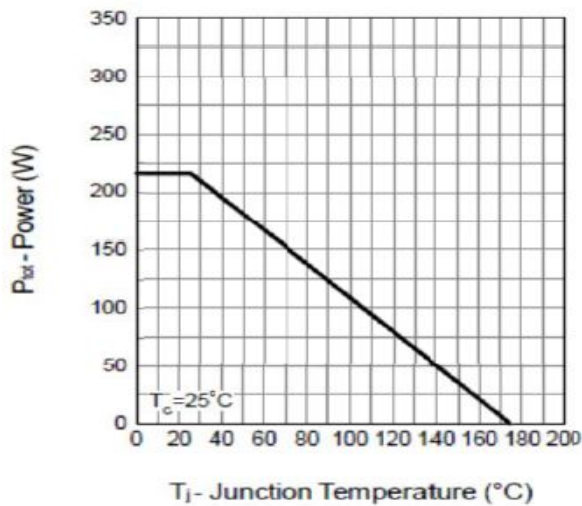
**Capacitance**



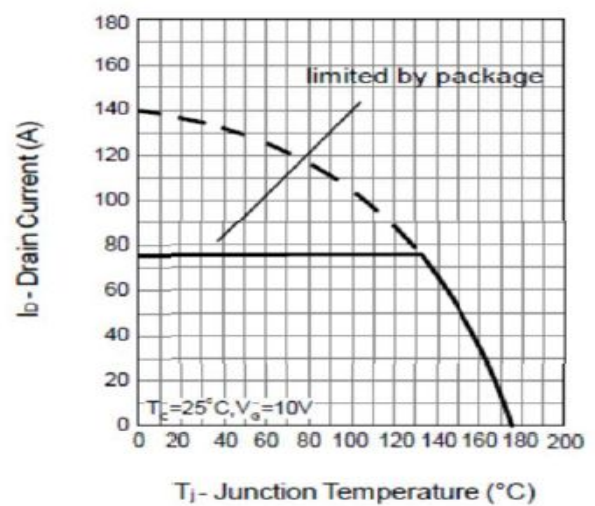
**Gate Charge**



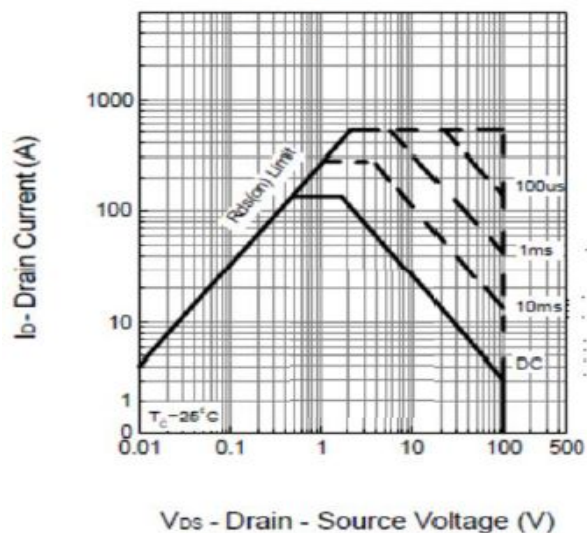
**Power Dissipation**



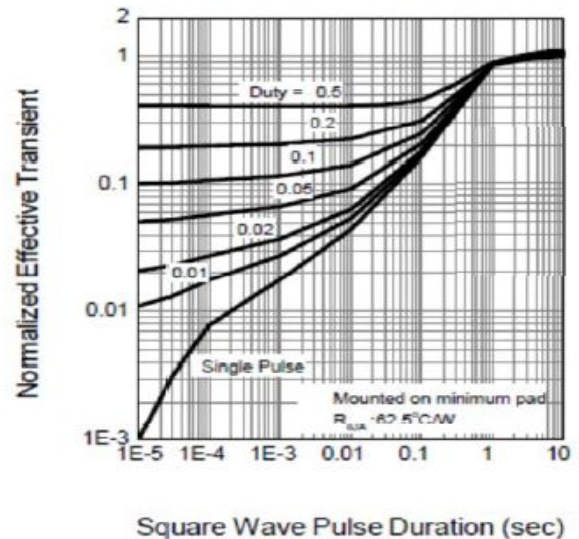
**Drain Current**



**Safe Operation Area**



**Thermal Transient Impedance**



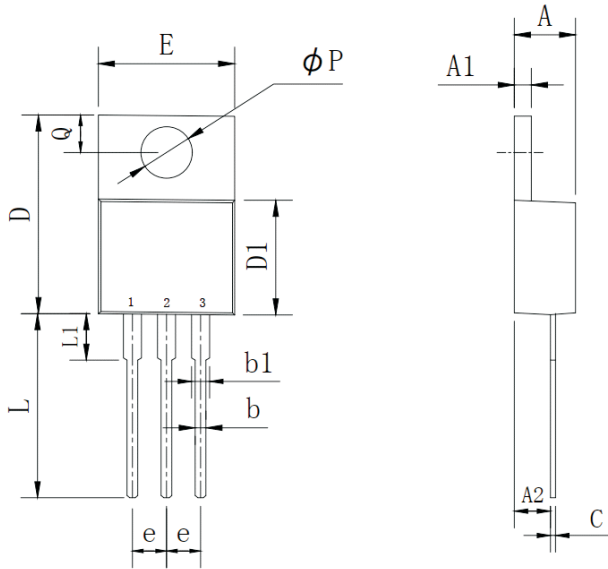


# D150N10 D150N10D

## 100V N-Channel Power MOSFET

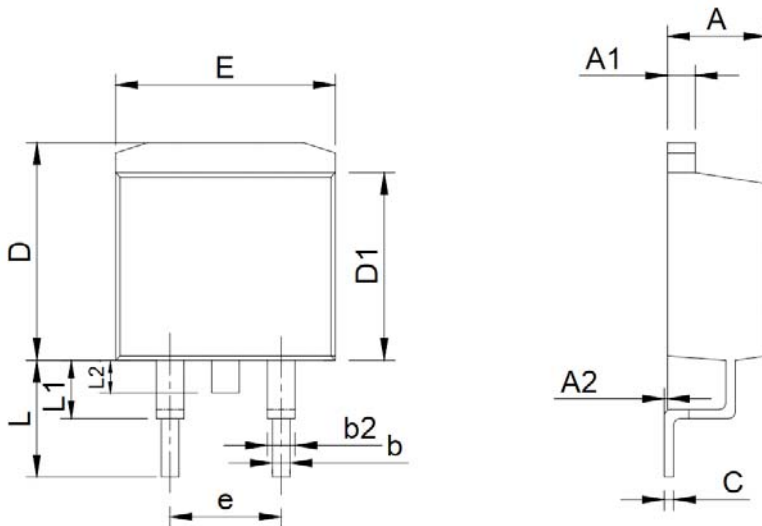
### Dimensions

#### TO-220 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	2.03	2.92	0.080	0.115
b	0.51	1.11	0.020	0.044
b1	0.97	1.6	0.038	0.063
C	0.3	0.7	0.012	0.028
D	14.6	15.9	0.575	0.626
D1	8.04	9.3	0.317	0.366
E	9.57	10.57	0.377	0.416
e	2.34	2.74	0.092	0.108
L	12.58	14.3	0.495	0.563
L1	2.8	4.2	0.110	0.165
P	3.4	4.14	0.134	0.163
Q	2.45	3	0.096	0.118

#### TO-263 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	0	0.25	0.000	0.010
b	0.61	1.01	0.024	0.040
b1	1.2	1.34	0.047	0.053
C	0.3	0.6	0.012	0.024
D	9.48	10.84	0.373	0.427
D1	8.49	9.3	0.334	0.366
E	9.7	10.31	0.382	0.406
e	4.88	5.28	0.192	0.208
L	4.46	5.85	0.176	0.230
L1	1.33	2.33	0.052	0.092
L2	0	2.2	0.000	0.087

# D150N10 D150N10D

## 100V N-Channel Power MOSFET

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