

Features

- Uses advanced SGT technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

Product Summary			
V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)	Q_g (Typ)
100V	1.7 @ 10V 30A	255	175nc

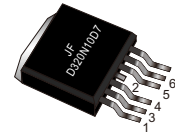
Mechanical Data

- Case:TO-263-7L Package

TO-263-7L
D255N10D7

Application

- Motor control and drives
- DC/DC converter
- Battery management



Ordering Information

Part No.	Package Type	Package	Quality(box)
D255N10D7	TO-263-7L	Tape & Reel	800

Block Diagram

Pin Definition:

1. Gate
2. Drain
3/4/5/6/7. Source

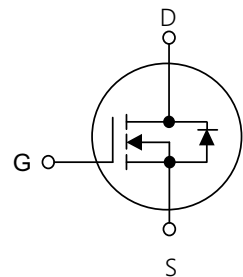


Table1 Absolute Maximum Ratings (Tc=25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	255	A
		162	
Pulsed Drain Current (Note 1)	I_{DM}	1036	A
Single Pulse Avalanche Energy(Note 2)	E_{AS}	1936	mJ
Power Dissipation Tc=25°C	P_D	250	W
Operating Junction and Storage Temperature	T_J/T_{STG}	-55~+150	°C

Table 2. Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance Junction to Ambient. Max	$R_{\theta JA}$	42	$^{\circ}\text{C}/\text{W}$
Thermal resistance Junction to Case. Max	$R_{\theta JC}$	0.5	$^{\circ}\text{C}/\text{W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V,I _D =250μA	100	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =100V,V _{GS} =0V	-	-	1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} =20V,V _{DS} =0V	-	-	100	nA
	Reverse		V _{GS} = -20V,V _{DS} =0V	-	-	-100	nA
On Characteristics(Note 3)							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V,I _D =30A	-	1.7	2.0	mΩ
Dynamic Characteristics(Note 4)							
Input Capacitance		C _{ISS}	V _{DS} =50V,V _{GS} =0V,f=1MHz	-	10120	-	pF
Output Capacitance		C _{OSS}		-	1360	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	50	-	pF
Switching Characteristics (Note 4)							
Turn-On Delay Time		td(on)	V _{DS} =50V, V _{GS} =10V,R _L =6Ω,	-	85	-	ns
Turn-On Rise Time		t _{TR}		-	138	-	ns
Turn-Off Delay Time		td(off)		-	93	-	ns
Turn-Off Fall Time		t _f		-	98	-	ns
Total Gate Charge		Q _G	V _{DS} =50V,I _D =50A, V _{GS} =10V	-	175	-	nC
Gate-Source Charge		Q _{GS}		-	48	-	nC
Gate-Drain Charge		Q _{GD}		-	53	-	nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V,I _S =50A	-	-	1.2	V
Reverse Recovery Time		t _{rr}	I _F =50A,dI _F /dt=500A/μs	-	80	-	ns
Reverse Recovery Charge		Q _{RR}	I _F =50A,dI _F /dt=100A/μs	-	180	-	nC

Notes: 1 Repetitive Rating:Pulse width limited by maximum junction temperature

2 $L = 0.5\text{mH}$, $R_G = 25\Omega$, Starting $T_J=25^{\circ}\text{C}$

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

4 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

Figure 1. Output Characteristics

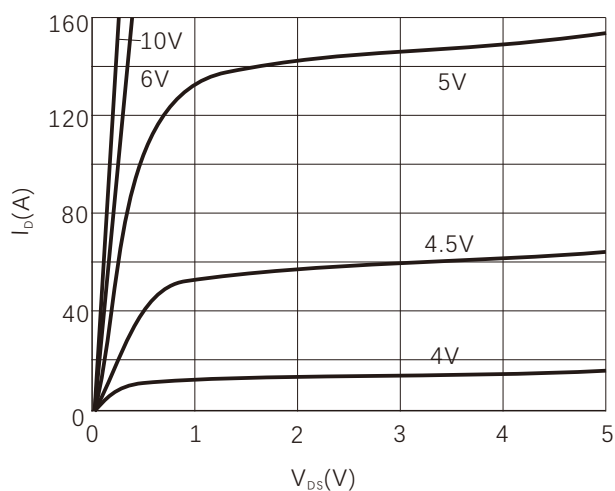


Figure 2. Normalized $R_{DS(ON)}$ vs Temperature

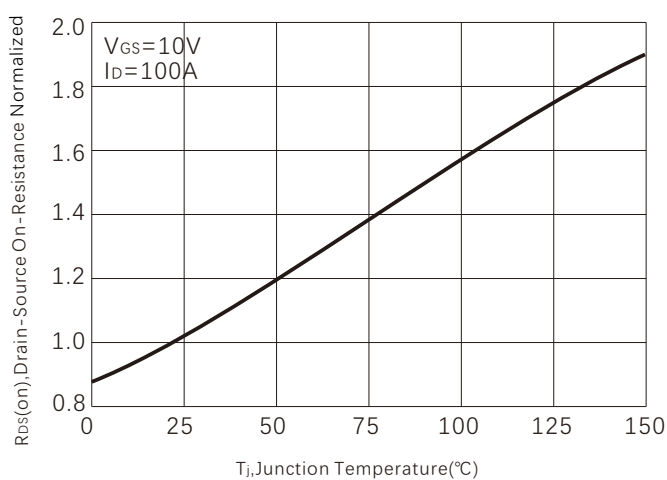


Figure 3. V_{TH} vs Junction Temperature

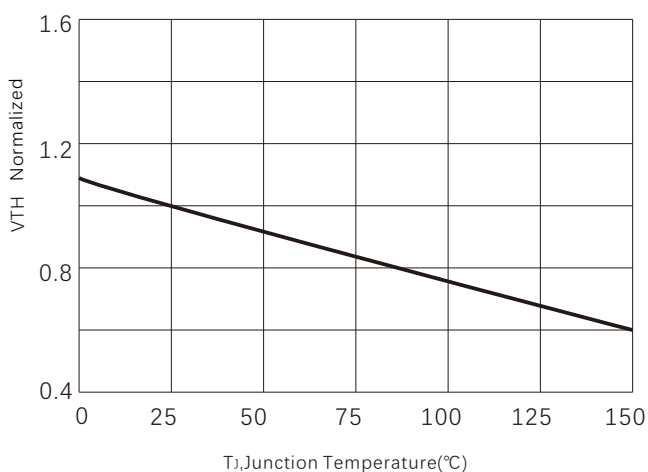


Figure 4. Capacitance

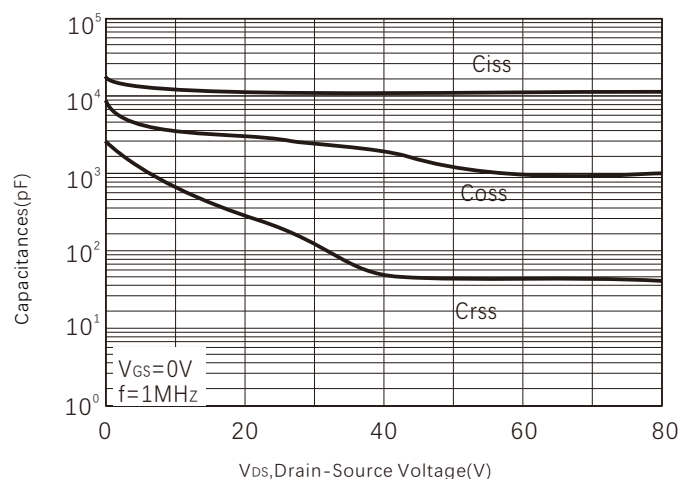


Figure 5. Gate charge

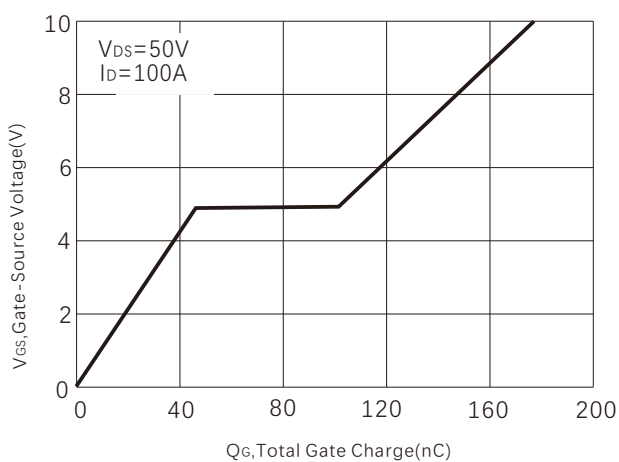


Figure 6. Source-Drain Diode Forward Voltage

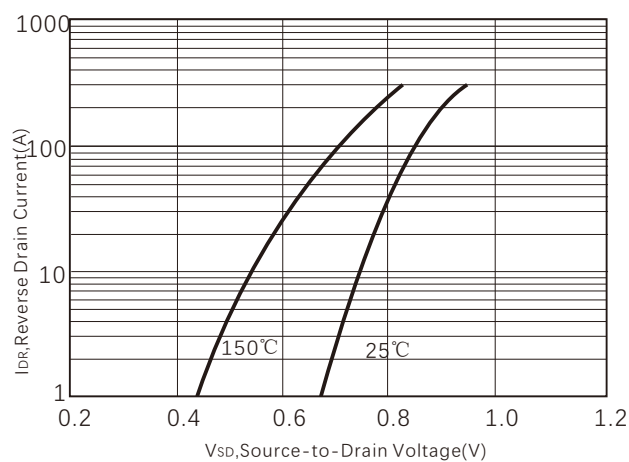


Figure7.Maximum Drain Current vs Temperature

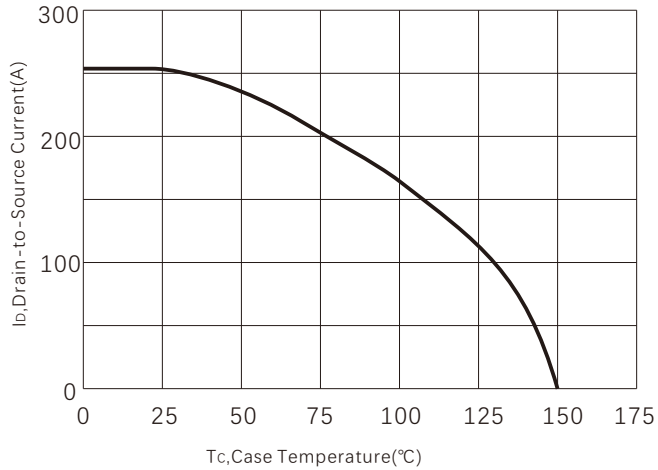


Figure 8. Power dissipation

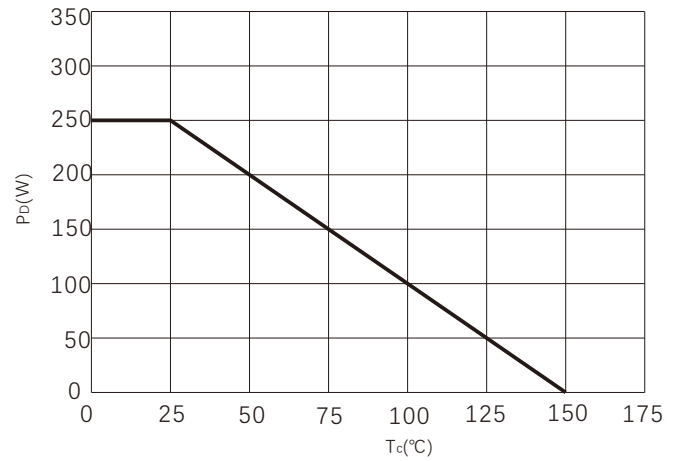


Figure 9. Safe operating area

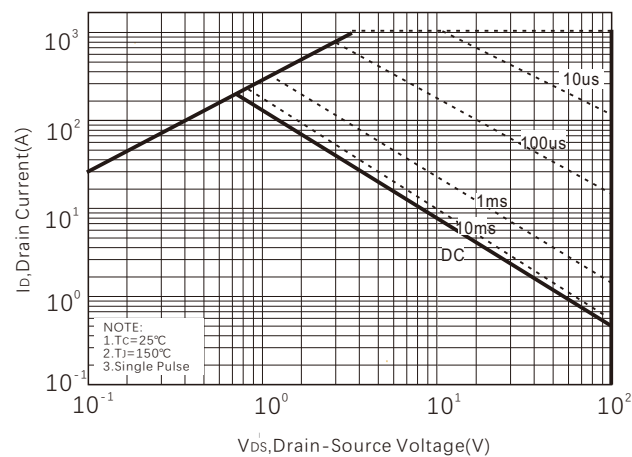
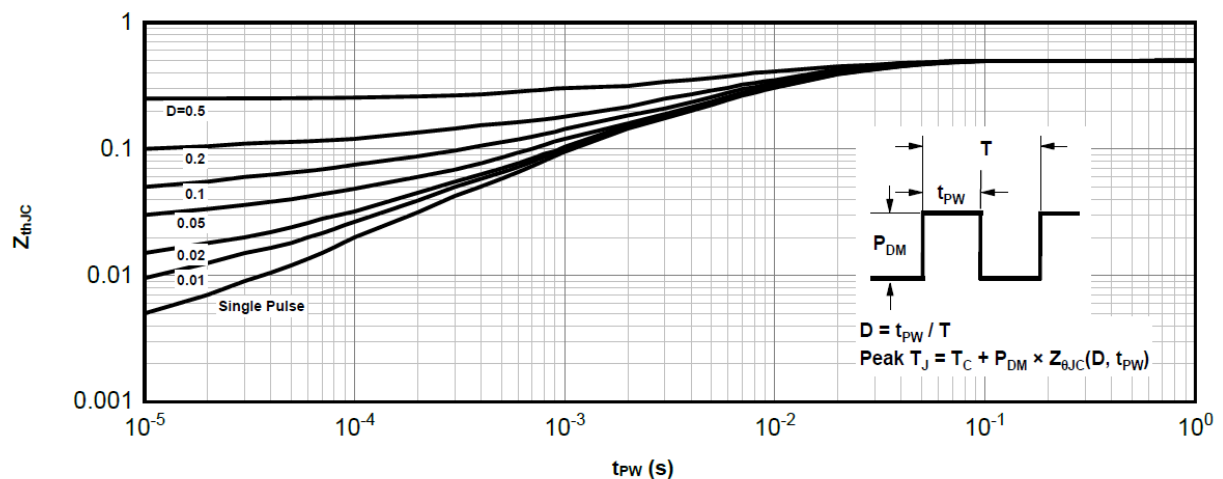
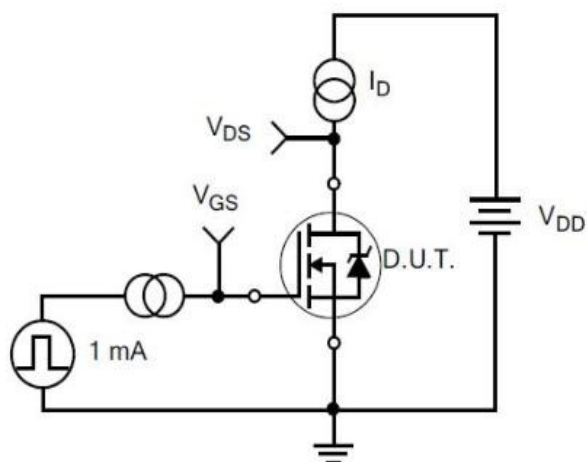


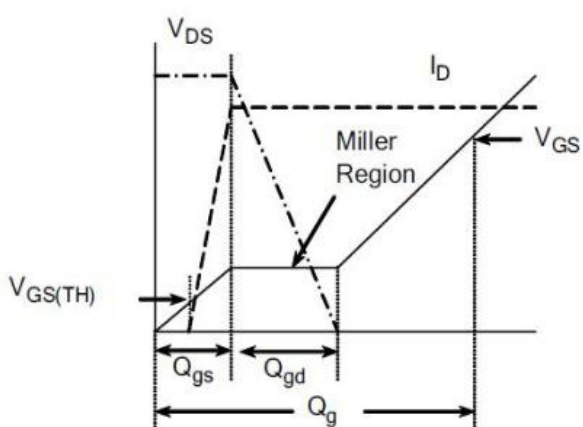
Figure 10. Maximum Transient Thermal Impedance



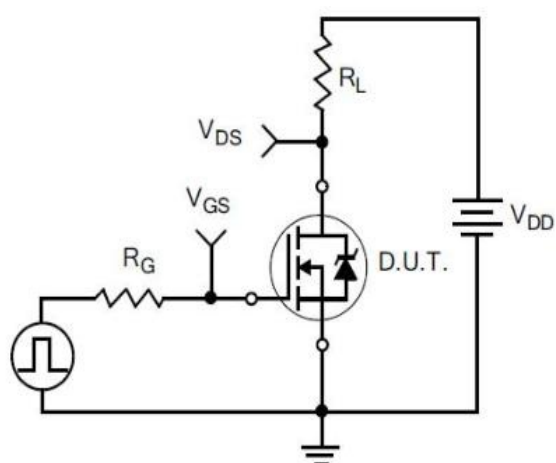
Typical Test Circuit



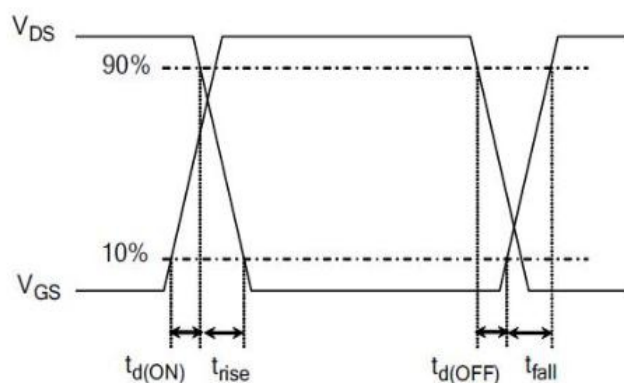
1) Gate Charge Test Circuit



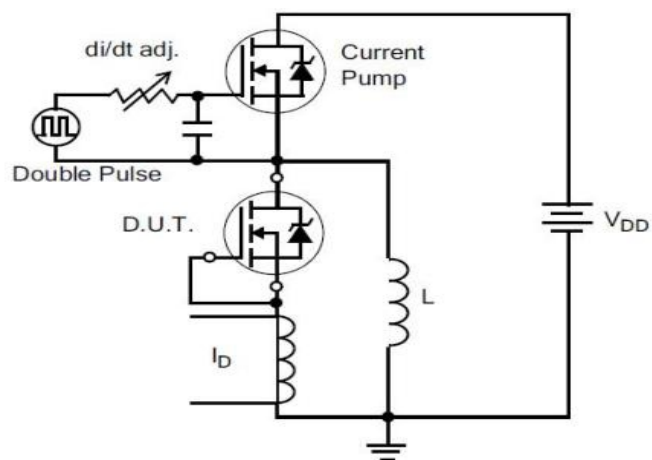
2) . Gate Charge Waveform



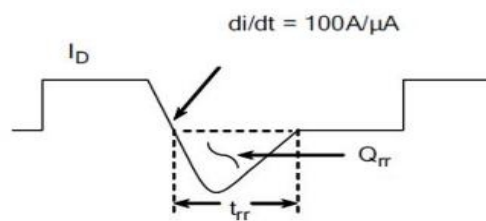
3) Resistive Switching Test Circuit



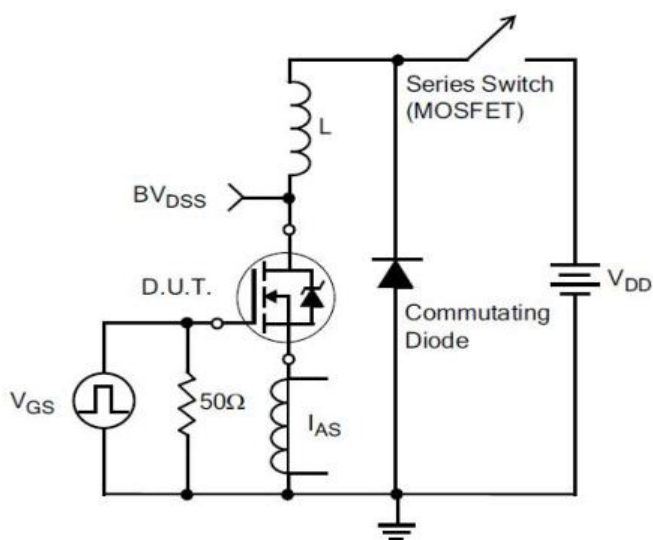
4) Resistive Switching Waveforms



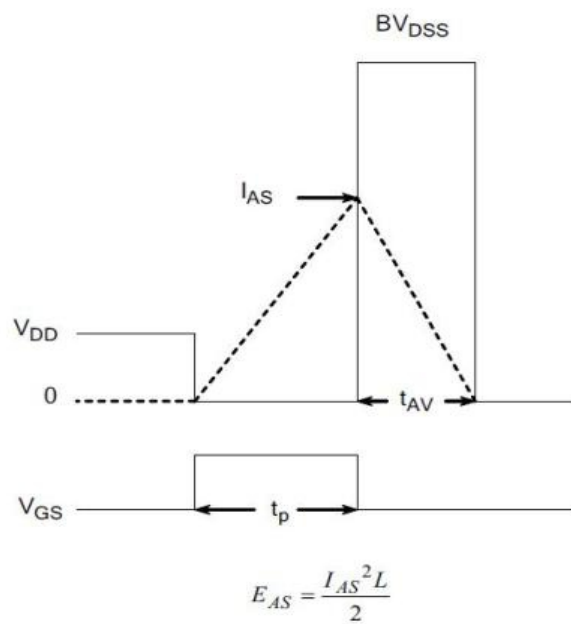
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

Product Names Rules

X X X N E X X X-X X X

Process Type:
VDMOS:default
Super junction:SJ
Low Voltage trench:D

Rdson Code
2 Ω :2D0
9.5m Ω :9M5

Rated Current Code
With 2-3 Digital,
For Ex ample:
320A:320,
0.8A:08,

Package Code
TO-220:Default
ITO-220:F
TO-262:E
TO-263:D
TO-252:M
TO-251:N
TO-263-7L:D7
TO-247:P

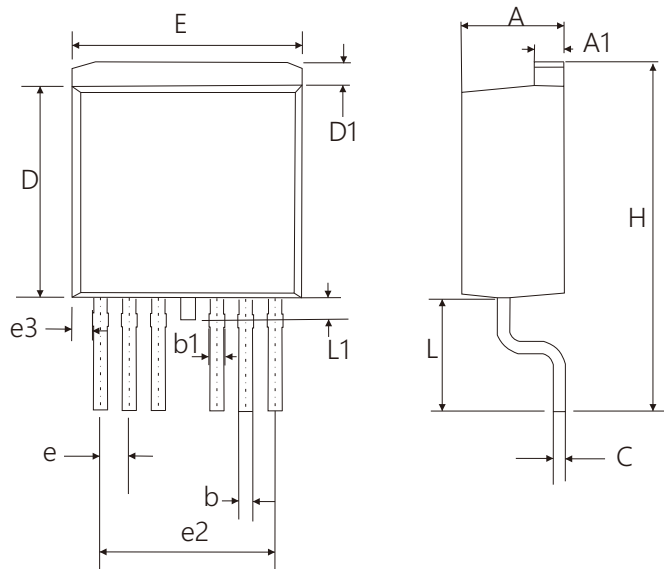
Channel Code
N channel:N
P channel:P

Rated Voltage Code
With 2 Digital,For Example:
600V:60
60V:06

Special Function Code
G-S ESD Protection:E
No Protection:Default

Dimensions

TO-263-7L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.75	0.167	0.187
A1	1.2	1.4	0.047	0.055
b	0.5	0.7	0.020	0.028
b1	0.5	0.9	0.020	0.035
C	0.4	0.6	0.016	0.024
D	9.05	9.45	0.356	0.372
D1	0.7	1.3	0.028	0.051
E	9.8	10.2	0.386	0.402
e	1.07	1.47	0.042	0.058
e2	7.32	7.92	0.288	0.312
e3	0.64	1.04	0.025	0.041
H	14.65	15.65	0.577	0.616
L	4.47	5.47	0.176	0.215
L1	0.90	1.50	0.035	0.059

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