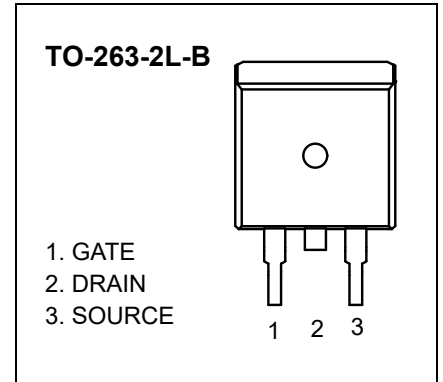




## TO-263-2L-B Plastic-Encapsulate MOSFETS

### CJB3R5SN10MS N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
100V	2.9mΩ@10V	200A



#### DESCRIPTION

The N-channel Power MOSFET uses shielded gate trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

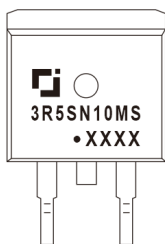
#### FEATURES

- Low  $R_{DS(on)}$
- Low Gate Charge

#### APPLICATIONS

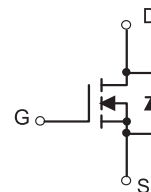
- High efficiency power supply
- Secondary synchronus rectifier

#### MARKING



3R5SN10MS = Device code.  
Solid dot = Green molding compound device,  
if none, the normal device.  
XXXX = Code.

#### EQUIVALENT CIRCUIT



#### MAXIMUM RATINGS ( $T_J=25^\circ\text{C}$ unless otherwise noted )

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	100	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current	$I_D$ ①	$T_C = 25^\circ\text{C}$	200	A
		$T_C = 100^\circ\text{C}$	126	A
Pulsed Drain Current	$I_{DM}$ ①②	800	A	
Continuous Drain Current	$I_D$ ⑥	$T_A = 25^\circ\text{C}$	18	A
		$T_A = 75^\circ\text{C}$	14	A
Single Pulsed Avalanche Energy	$E_{AS}$ ③	625	mJ	
Power Dissipation	$P_D$ ①	250	W	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~+150	$^\circ\text{C}$	

#### Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑥	39	59	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$ ①	0.33	0.5	$^\circ\text{C/W}$

# MOSFET ELECTRICAL CHARACTERISTICS

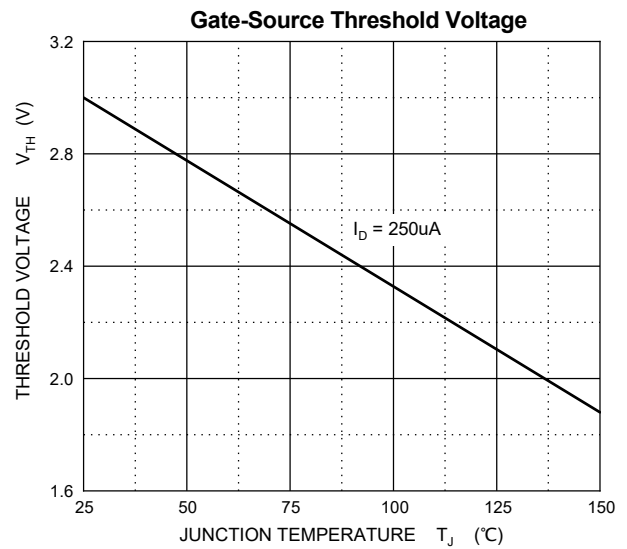
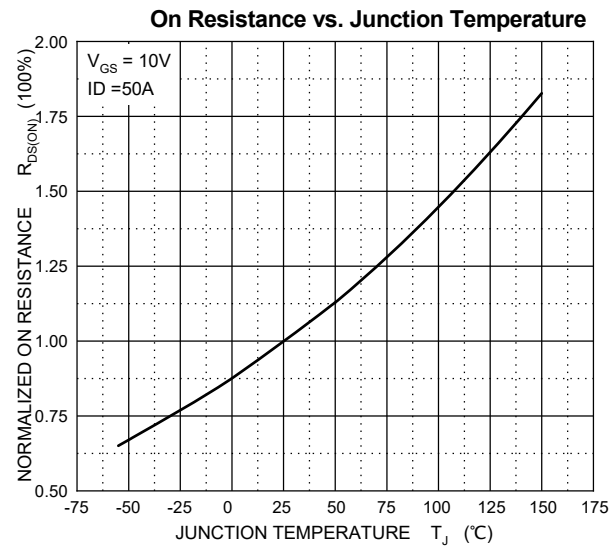
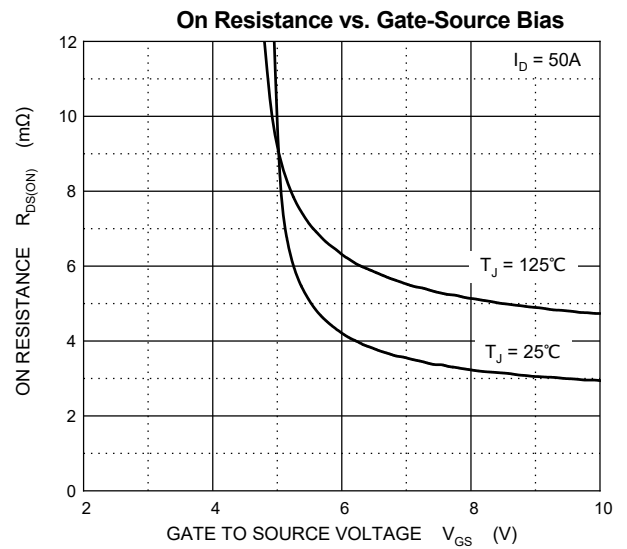
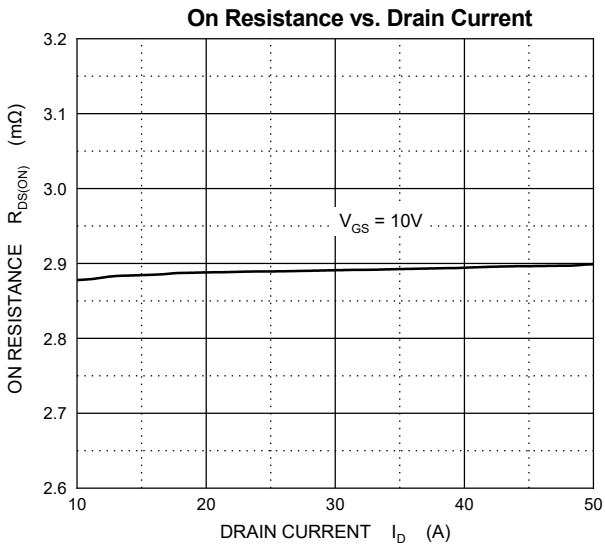
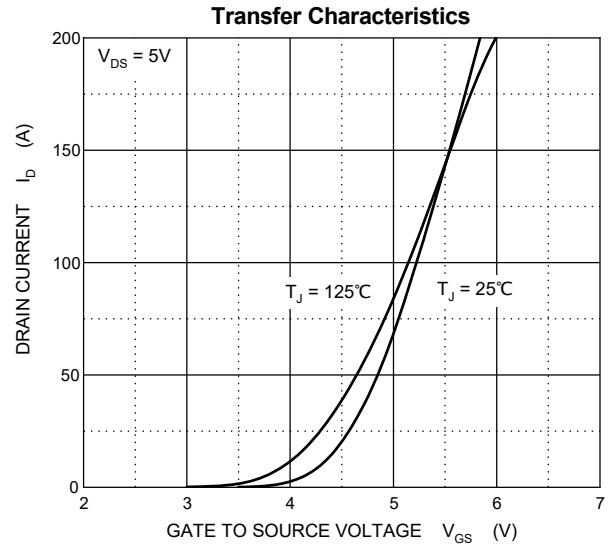
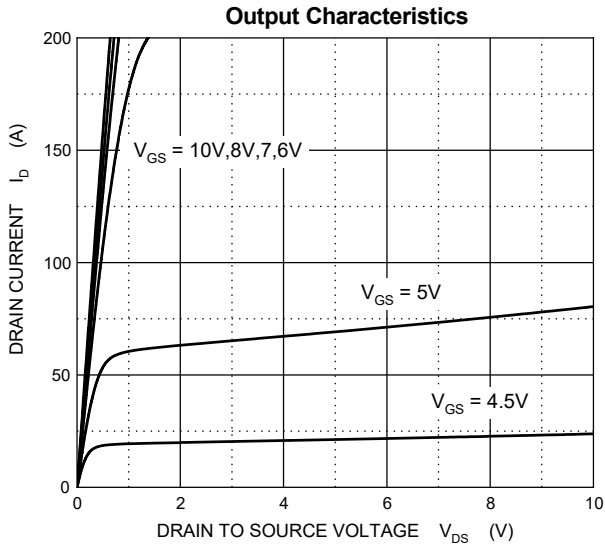
$T_J=25^{\circ}\text{C}$  unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
<b>Off characteristics</b>							
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 100V, V_{GS} = 0V$	$T_J = 25^{\circ}\text{C}$	-	-	1.0	$\mu A$
			$T_J = 125^{\circ}\text{C}$	-	-	100	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA	
<b>On characteristics</b> <sup>④</sup>							
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.4	3.0	3.6	V	
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 50A$	-	2.9	3.5	m $\Omega$	
<b>Dynamic characteristics</b> <sup>⑤</sup>							
Input capacitance	$C_{iss}$	$V_{DS} = 50V, V_{GS} = 0V, f = 100\text{KHz}$	-	7320	-	pF	
Output capacitance	$C_{oss}$		-	940	-		
Reverse transfer capacitance	$C_{rss}$		-	50	-		
Gate resistance	$R_g$	$f = 1\text{MHz}$	-	1.0	-	$\Omega$	
<b>Switching characteristics</b> <sup>⑤</sup>							
Total gate charge	$Q_g$	$V_{GS} = 10V, V_{DS} = 50V, I_D = 50A$	-	122	-	nC	
Gate-source charge	$Q_{gs}$		-	32	-		
Gate-drain charge	$Q_{gd}$		-	35	-		
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 50V, I_D = 50A, V_{GS} = 10V, R_g = 6\Omega$	-	22	-	ns	
Turn-on rise time	$t_r$		-	14	-		
Turn-off delay time	$t_{d(off)}$		-	36	-		
Turn-off fall time	$t_f$		-	10	-		
<b>Drain-Source Diode Characteristics</b>							
Drain-source diode forward voltage	$V_{SD}$ <sup>④</sup>	$V_{GS} = 0V, I_S = 50A$	-	-	1.2	V	
Continuous drain-source diode forward current	$I_S$ <sup>①</sup>		-	-	200	A	
Pulsed drain-source diode forward current	$I_{SM}$ <sup>①②</sup>		-	-	800	A	
Reverse recovery time	$t_{rr}$	$di_S/dt = 600A/\mu s, I_S = 50A, V_{DD} = 50V$	-	40	-	ns	
Reverse recovery charge	$Q_{rr}$		-	478	-	nC	

Notes:

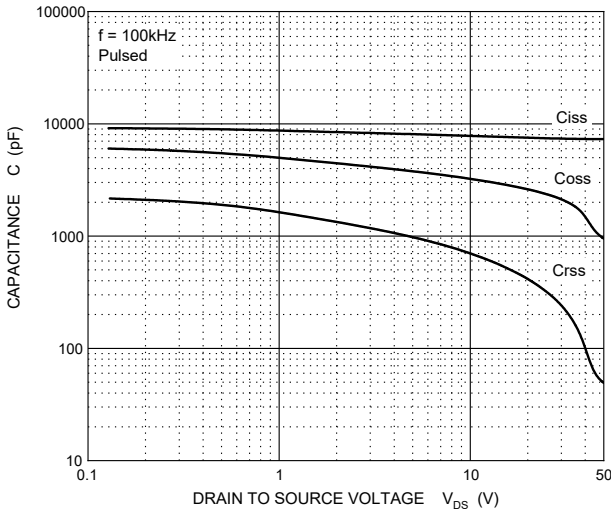
- $T_C = 25^{\circ}\text{C}$  Limited only by maximum temperature allowed.
- $P_W \leq 10\mu s$ , Duty cycle  $\leq 1\%$ .
- EAS condition:  $V_{DD} = 50V, V_{GS} = 10V, L = 0.5\text{mH}, R_g = 25\Omega$  Starting  $T_J = 25^{\circ}\text{C}$ .
- Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production.
- Device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. double-sided Copper, in a still air environment with  $T_A = 25^{\circ}\text{C}$ .

# Typical Characteristics (T<sub>J</sub> = 25°C, unless otherwise specified)

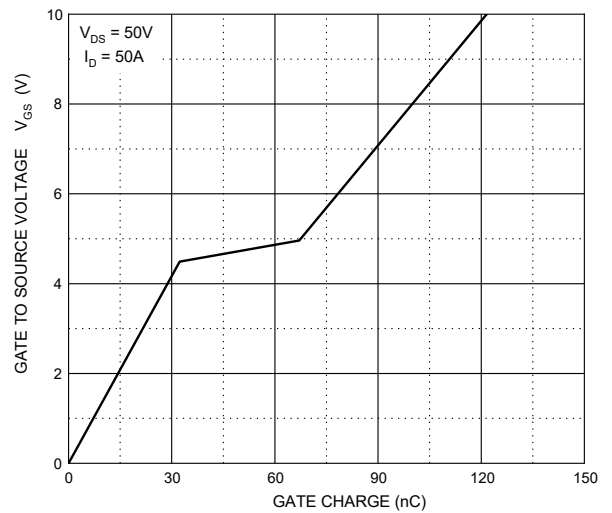


# Typical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

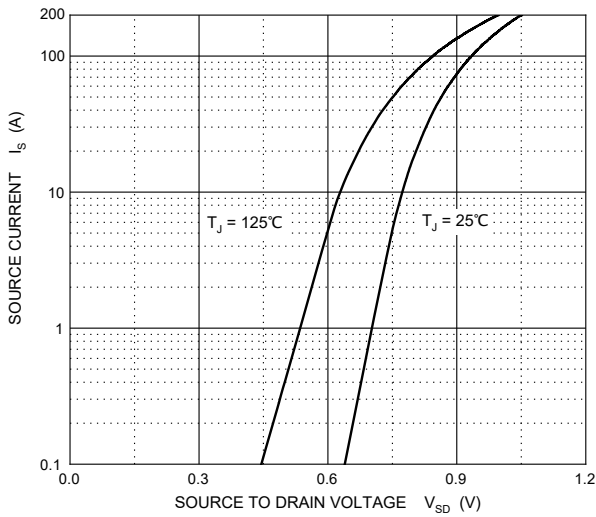
**Typical Capacitances**



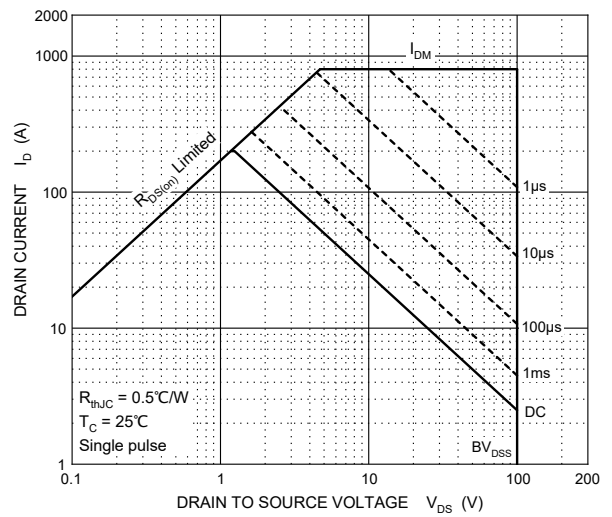
**Gate Charge**



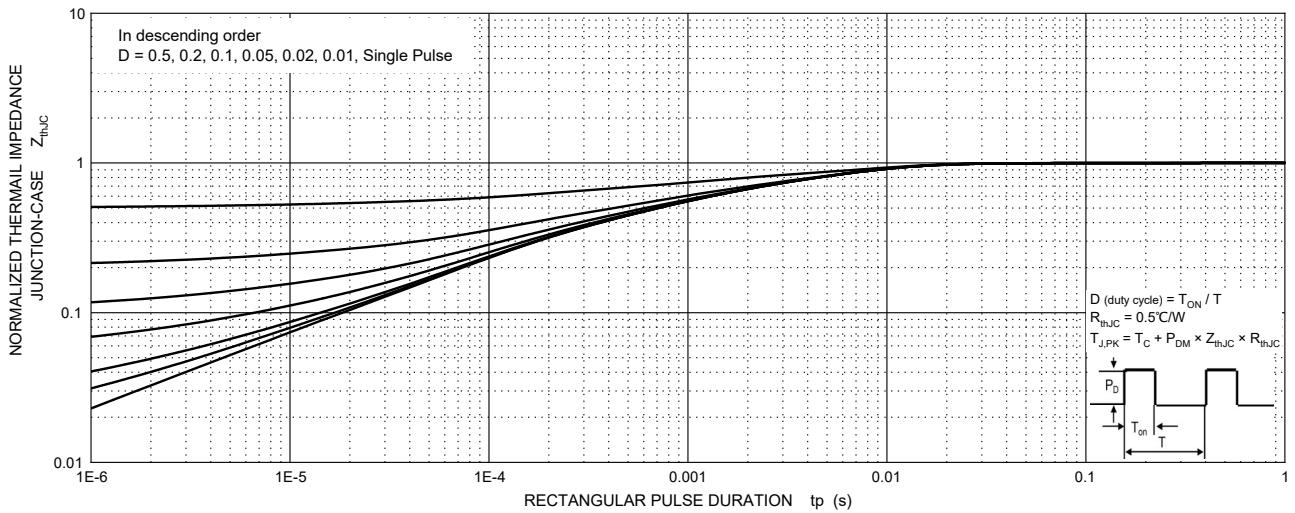
**Source-Drain Diode Forward Characteristics**



**Maximum Safe Operating Area**



**Transient Thermal Impedance, Junction-Case**

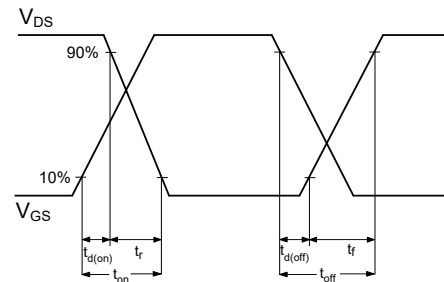
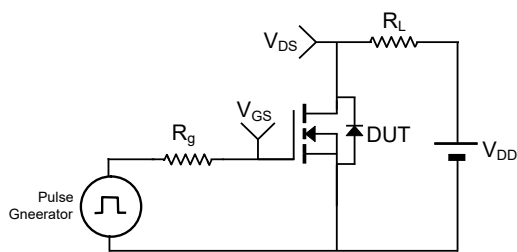


# TEST CIRCUIT AND WAVEFORMS

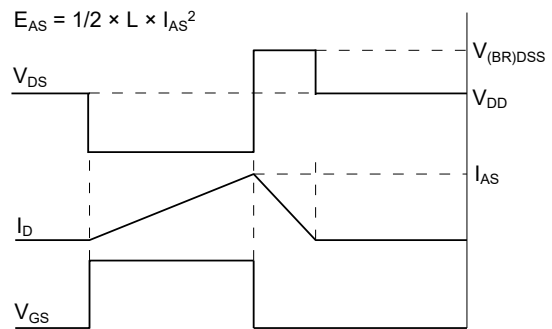
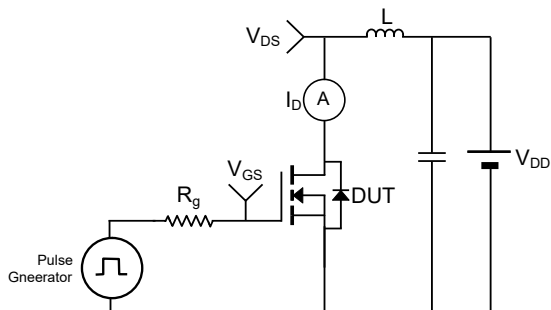
## Gate Charge



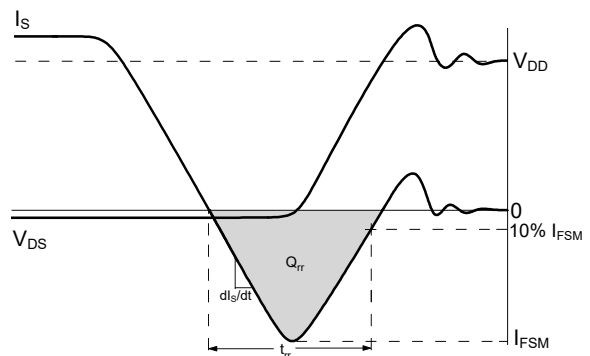
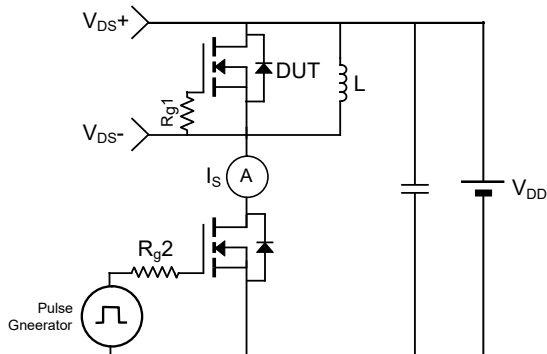
## Resistive Load Switching Time



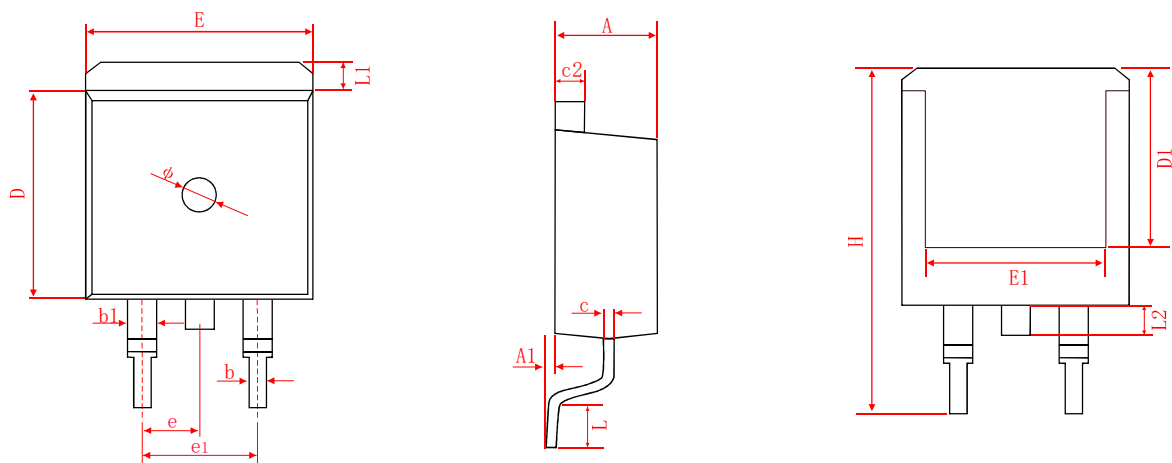
## Un-clamped Inductive Load Switching



## Drain-Source Body Diode Reverse Recovery

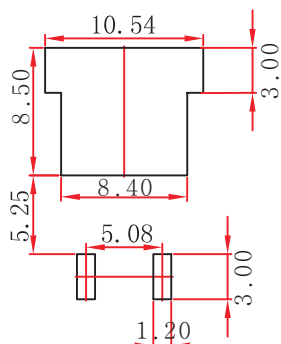


## TO-263-2L-B Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.40	4.60	0.173	0.181
A1	0.00	0.20	0.000	0.008
b	0.70	0.90	0.028	0.035
b1	1.24	1.40	0.049	0.053
c	0.45	0.55	0.018	0.022
c2	1.25	1.35	0.049	0.053
D	9.10	9.30	0.358	0.366
D1	7.900 TYP.		0.311 TYP.	
e	2.540 TYP.		0.100 TYP.	
e1	5.080 TYP.		0.200 TYP.	
E	9.88	10.15	0.389	0.400
E1	7.85	8.15	0.309	0.321
H	15.00	15.30	0.591	0.602
L	2.10	2.36	0.083	0.093
L1	1.12	1.42	0.044	0.056
L2	1.10	1.50	0.043	0.059
$\phi$	1.500 TYP.		0.059 TYP.	

## TO-263-2L Suggested Pad Layout



### Note:

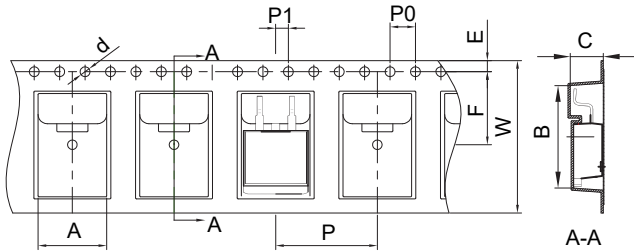
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

### NOTICE

JSCJ reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSCJ does not assume any liability arising out of the application or use of any product described herein.

# TO-263-2L Tape and Reel

## TO-263-2L Embossed Carrier Tape

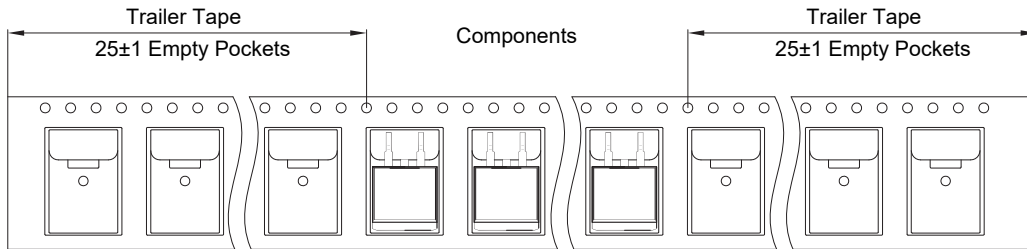


### Packaging Description:

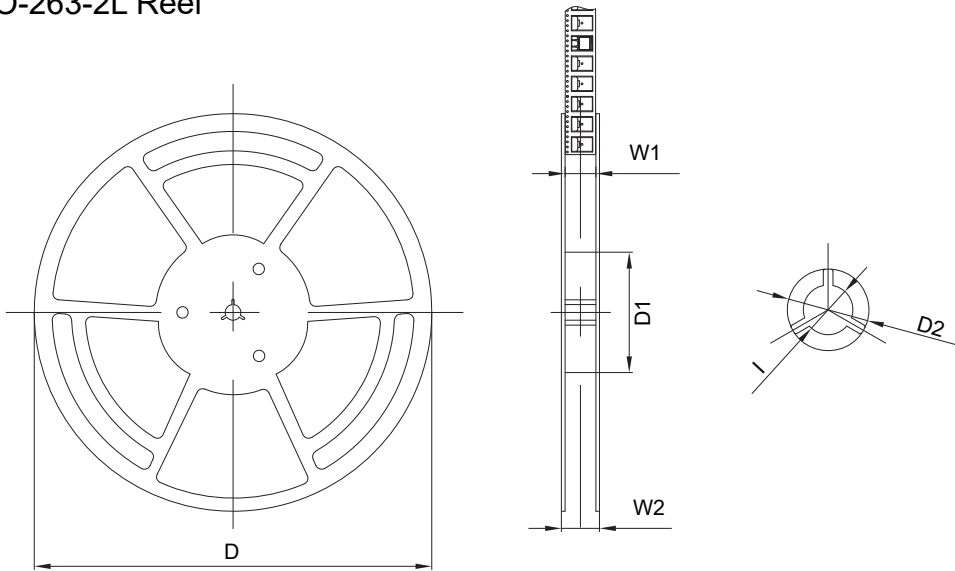
TO-263-2L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Hear Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 800 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
TO-263	10.80	16.13	5.21	Φ1.55	1.75	11.50	4.00	16.00	2.00	24.00

## TO-263-2L Tape Leader and Trailer



## TO-263-2L Reel



Dimensions are in millimeter						
Reel	D	D1	D2	W1	W2	l
13" Dia	330.00	100.00	Φ21.00	24.40	30.40	Φ13.00

Reel	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
800 pcs	13 inch	1600 pcs	360×360×65	8000 pcs	378×358×382