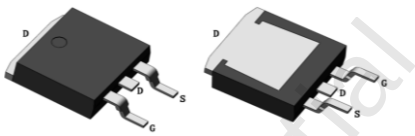
DP65R190BJ

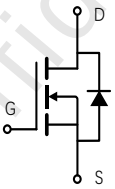
SJ N-MOSFET 650V, 155mΩ, 20A

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$	I_D
DP65R190BJ	650V	155mΩ	20A

TO-263





100% Avalanche Tested

100% Rg Tested

Features

- Super_Junction technology
- Low conduction resistance, superior switching performance
- High avalanche energy
- Better efficiency due to very low FOM

Applications

- Power factor correction
- Charger
- LED Lighting

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP65R190BJ	65R190BJ	TO-263	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 20 13	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	60	A
Avalanche energy, single pulse (L=30mH, Rg=25)[1]	E_{AS}	235	mJ
Peak diode recovery dv/dt[2]	dv/dt	50	V/ns
Gate-Source voltage	V_{GS}	±30	V
Power dissipation (T_C = 25°C)	P_{tot}	223	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

[1].EAS is tested at starting T_j = 25°C, V_{GS} = 10V.

[2]. Identical low side and high side switch with identical Rg

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.6	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	65	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	650	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	3	-	4.8	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- 20	1 -	μA	V_{DS}=650V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±30V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	155	190	mΩ	T_j=25°C VGS=10V, ID=10A
Gate resistance	R_g	-	1	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	24	-	S	VDS=20V,ID=10A
Dynamic Characteristic[3]						
Input Capacitance	C_{iss}	-	1757	-	pF	V_{GS}=0V, V_{DS}=100V, f=1MHz
Output Capacitance	C_{oss}	-	70	-		
Reverse Transfer Capacitance	C_{rss}	-	35	-		
Gate Total Charge	Q_g	-	49	-	nC	VGS=10V, VDS=480V, ID=10A, f=1MHz
Gate-Source charge	Q_{gs}	-	12	-		
Gate-Drain charge	Q_{gd}	-	20	-		
Turn-on delay time	$t_{d(on)}$	-	39	-	ns	V_{GS}=10V, V_{DD}=400V, R_{G_ext}=10Ω
Rise time	t_r	-	28	-		
Turn-off delay time	$t_{d(off)}$	-	157	-		
Fall time	t_f	-	45	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.9	1.1	V	VGS=0V,ISD=10A
Diode continuous forward current	I_s	-	-	20	A	TC = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	60	A	TC = 25°C
Body Diode Reverse Recovery Time[3]	t_{rr}	-	305	-	ns	IF=10A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[3]	Q_{rr}	-	3.7	-	uC	

[3]. Defined by design. Not subject to production test

Typical Performance Characteristics

Fig 1: Output Characteristics

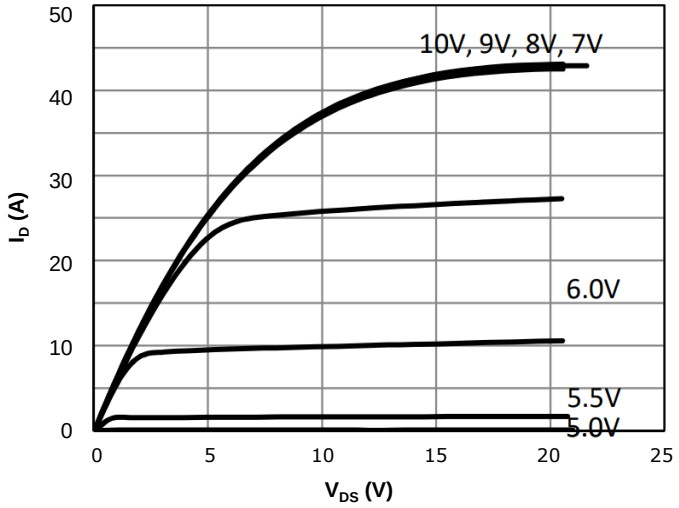


Fig 2: Transfer Characteristics

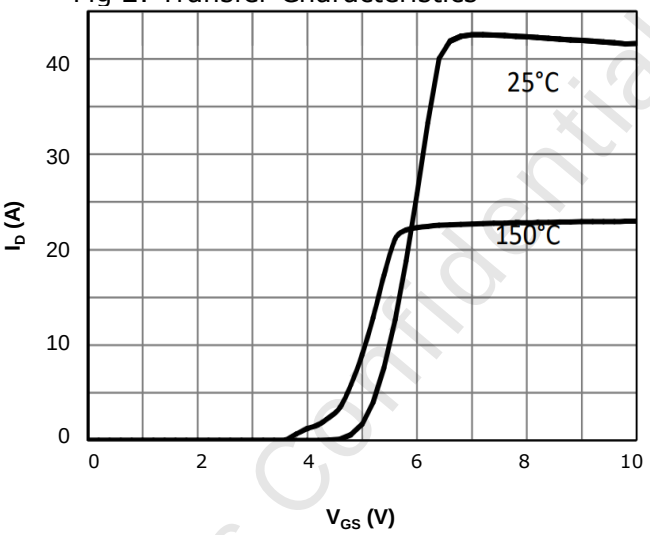


Fig 3: Rds(on) vs Drain Current and Gate Voltage

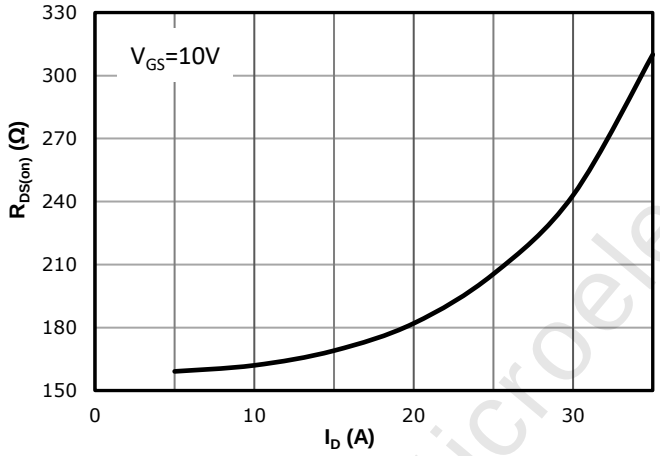


Fig 4: Break Down vs. Junction Temperature

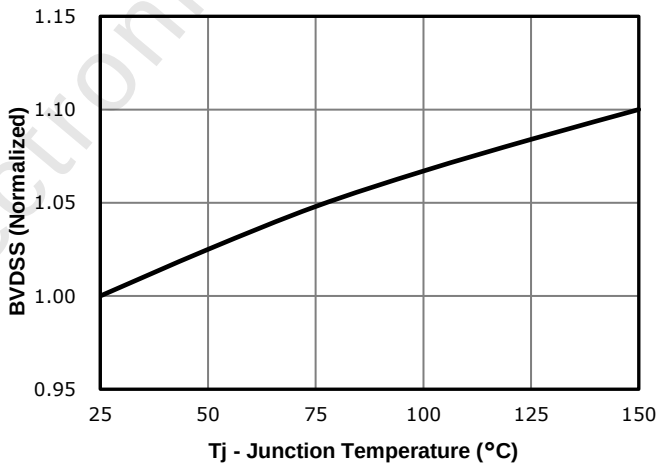


Fig 5: Rds(on) vs. Temperature

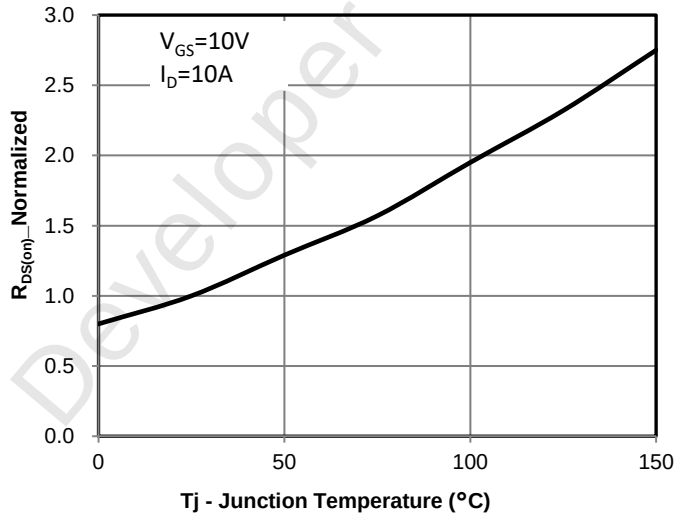


Fig 6: Capacitance Characteristics

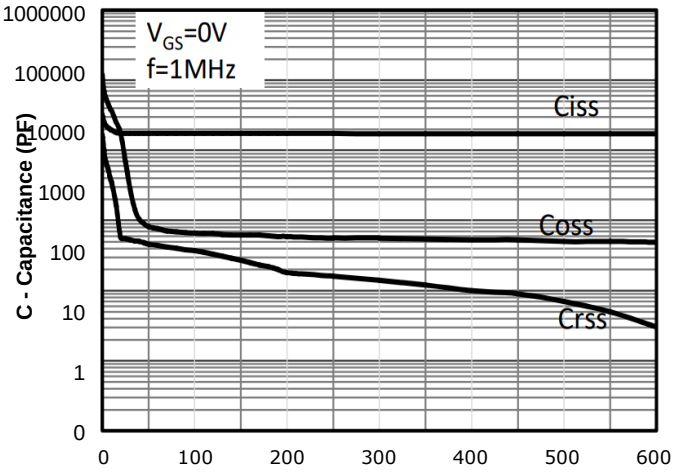


Fig 7: Gate Charge Characteristics

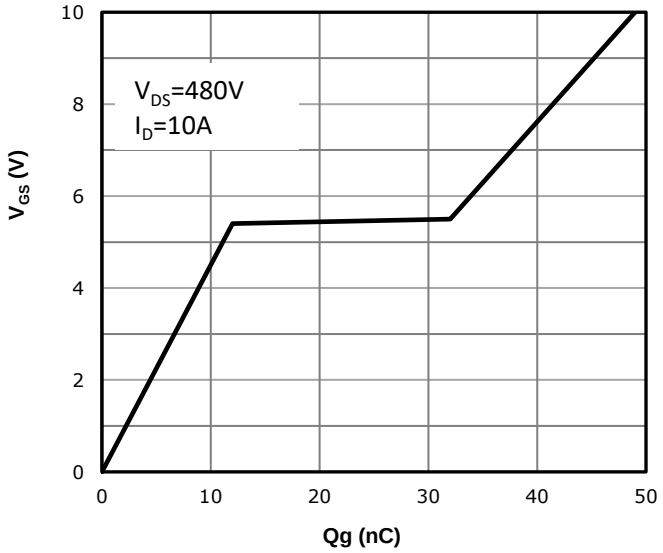


Fig 8: Body-diode Forward Characteristics

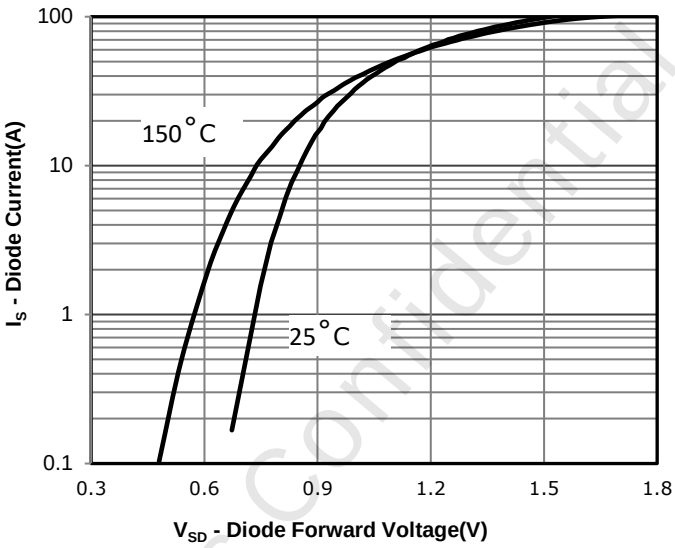


Fig 9: Rds(on) vs Gate Voltage

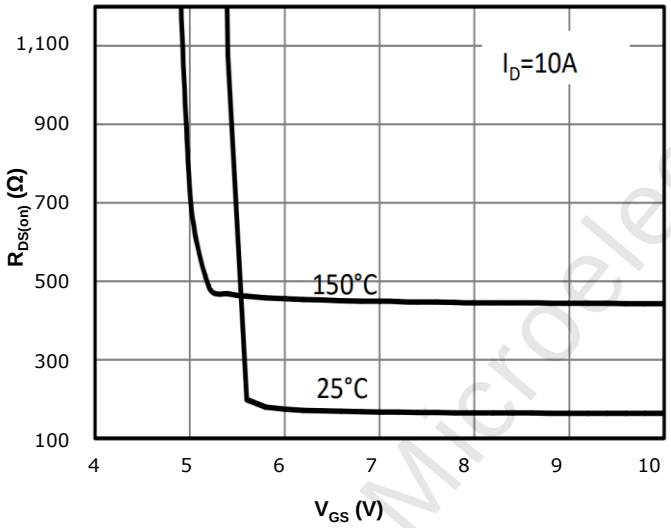


Fig 10: Drain Current Derating

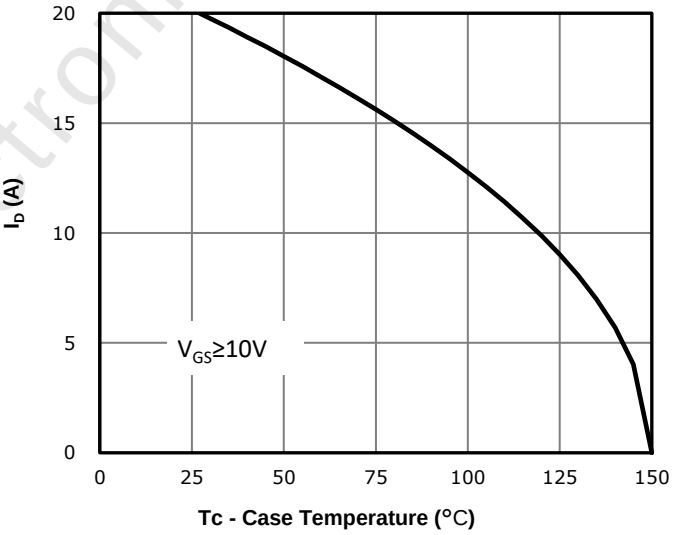


Fig 11: Safe Operating Area

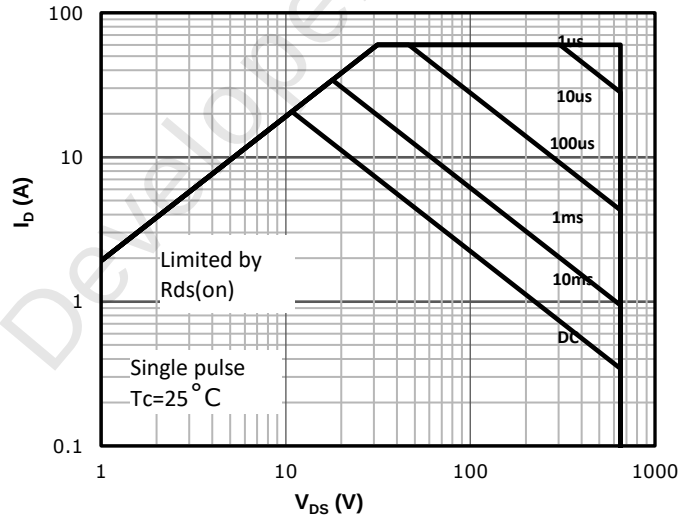
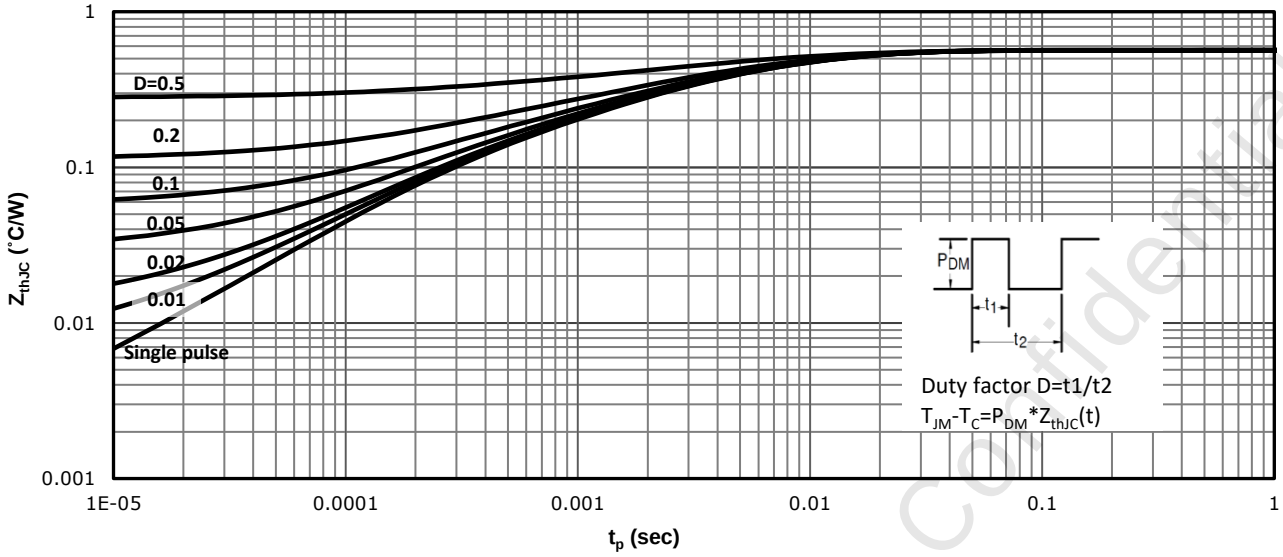
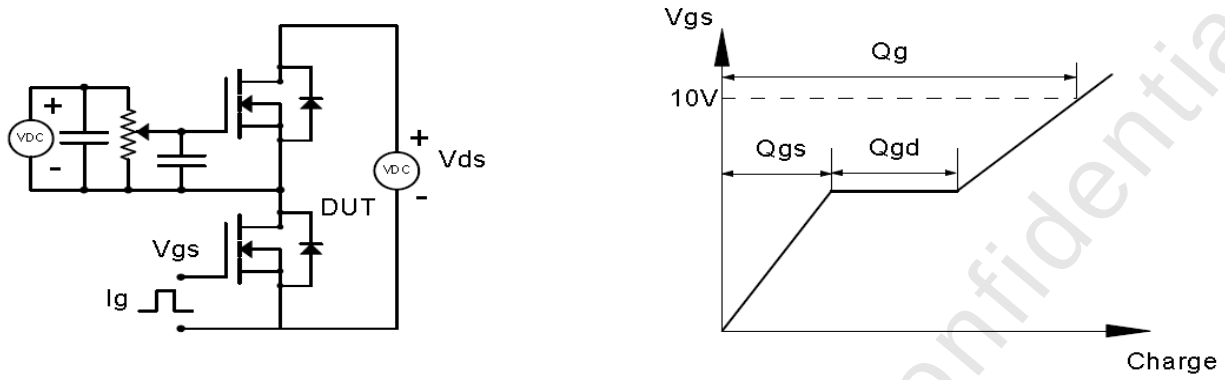


Fig 12: Max. Transient Thermal Impedance

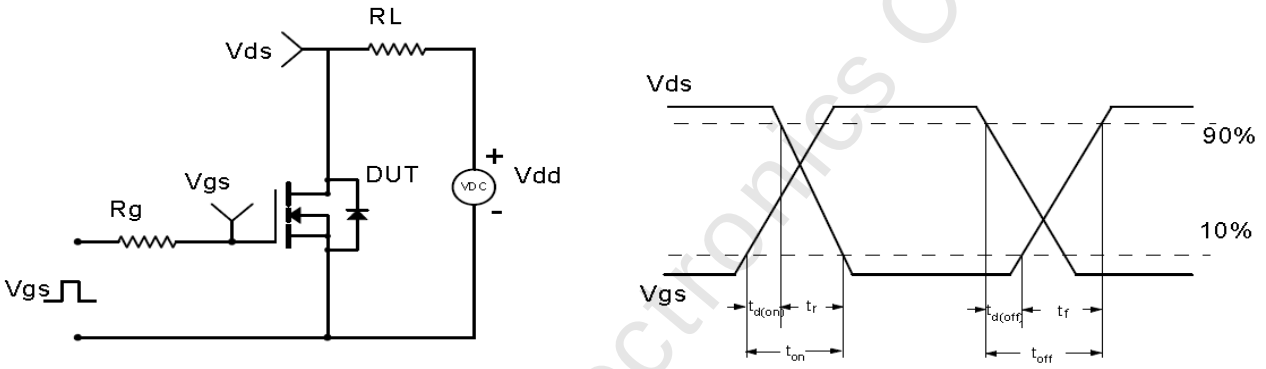


Test Circuit & Waveform

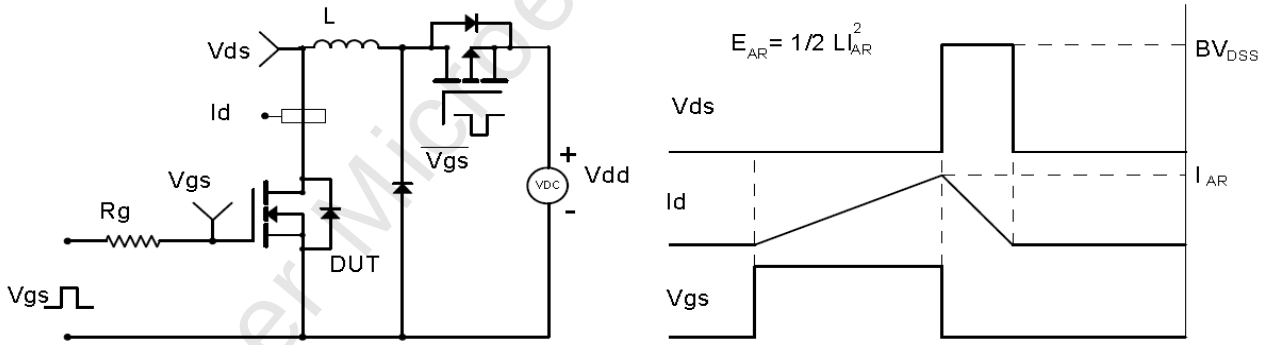
Gate Charge Test Circuit & Waveform



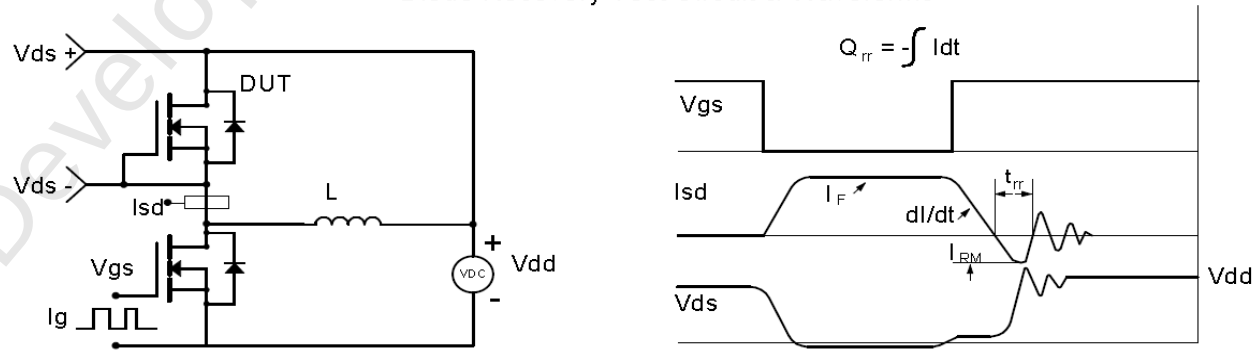
Resistive Switching Test Circuit & Waveforms



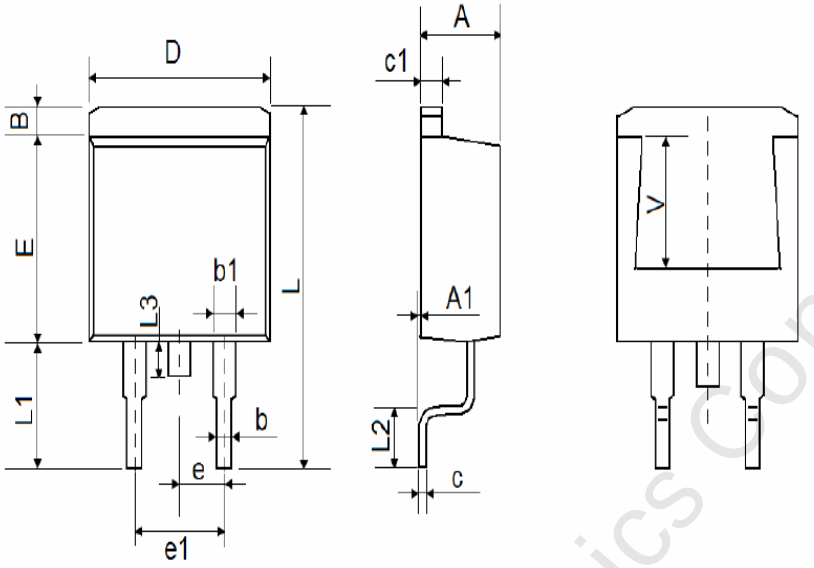
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

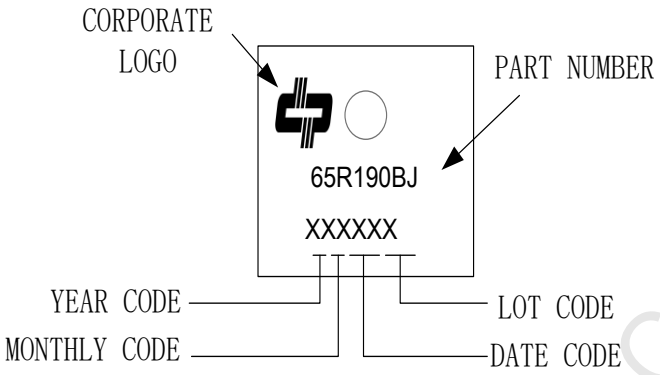


Package Outline: TO-263-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.80	0.173	0.189
A1	0.00	0.15	0.000	0.006
B	1.17	1.37	0.046	0.054
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.31	0.53	0.012	0.021
c1	1.17	1.37	0.046	0.054
D	10.01	10.31	0.394	0.406
E	8.50	8.90	0.335	0.350
e	2.54 BSC.		0.100 BSC.	
e1	4.98	5.18	0.196	0.204
L	15.05	15.45	0.593	0.608
L1	5.08	5.48	0.200	0.216
L2	2.34	2.74	0.092	0.108
L3	1.30	1.70	0.051	0.067
V	5.600 Ref.		0.220 Ref.	

Part Marking Information



Revision History

Revison	Major changes
1.0	Release for formal version

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