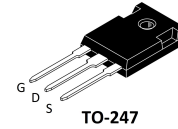
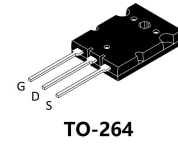


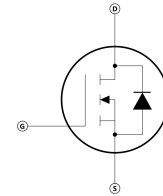
Features

- Ultra low $R_{DS(on)(typ.)}=33.5m\Omega$
- Ultra low gate charge
- 100% UIS tested
- RoHS compliant



Applications

- Power factor correction(PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible power supply(UPS)



Absolute Ratings ($T_c=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V_{DSS}		650	V
Transient Gate-Source Voltage	V_{GSM}		±30	V
Continuous Gate-Source Voltage(DC)	V_{GSS}		±20	V
Drain Current -continuous	I_D	$T_C=25^{\circ}C$	100	A
		$T_C=100^{\circ}C$	50	A
Drain Current - pulse (note 1)	I_{DM}		400	A
Avalanche current-single pulse	I_{AS}		16	A
Single Pulsed Avalanche Energy (note 2)	E_{AS}		64	mJ
Repetitive Avalanche current	I_{AR}		13	A
Repetitive Avalanche Energy	E_{AR}		42.25	mJ
Power Dissipation(TO-264)	P_D		1041	W
Power Dissipation(TO-247)	P_D		390	W
Operating and Storage Temperature Range	T_J, T_{STG}		-55~+150	℃
Solding temperature,wave soldering only allowed at leads.(1.6mm for 10s)	T_{sold}		260	℃

Electrical Characteristics($T_{CASE}=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	650	-	-	V

Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V,V _{GS} =0V		-	-	10	uA
Gate-body leakage current	I _{GSS}	V _{DS} =0V,V _{GS} =±20V		-	-	±200	nA
On-Characteristics							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250uA		3.0	3.8	4.6	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =40A	T _C =25℃	-	33.5	43	mΩ
			T _C =125℃	-	77	-	
Forward Transconductance	g _{fs}	V _{DS} =10V,I _D =40A (note 4)		-	95.7	-	S
Dynamic Characteristics							
Gate resistance	R _g	F=1.0MHz open drain		-	4.28	-	Ω
Input capacitance	C _{iss}	V _{DS} =400V, V _{GS} =0V, f=250kHz		-	8395	-	pF
Output capacitance	C _{oss}			-	181	-	pF
Reverse transfer capacitance	C _{rss}			-	12.4	-	pF
Switching Characteristics							
Turn-On delay time	t _{d(on)}	V _{DD} =300V,I _D =25A, V _{GS} =10V,R _G =3.3Ω (note 4,5)		-	54	-	ns
Turn-On rise time	t _r			-	67	-	ns
Turn-Off delay time	t _{d(off)}			-	147	-	ns
Turn-Off Fall time	t _f			-	50	-	ns
Total Gate Charge	Q _g	V _{DS} =300V,I _D =25A, V _{GS} =0 to 10V (note4,5)		-	170	-	nC
Gate-Source charge	Q _{gs}			-	61.9	-	nC
Gate-Drain charge	Q _{gd}			-	51	-	nC
Gate-plateau voltage	V _p			-	6.5	-	V
Drain-Source Diode Characteristics and Maximum Ratings							
Continuous Diode Forward Current	I _S	T _C =25℃		-	-	80	A
Diode Pulsed Current	I _{SM}	T _C =25℃		-	-	240	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S =1A		-	0.64	1.2	V
Reverse recovery time	t _{rr}	V _{GS} =0V,I _S =25A dI _F /dt=100A/us V _R =300V (note 4)		-	199.6	-	ns
Reverse recovery charge	Q _{rr}			-	1996	-	nC
Peak reverse recovery current	I _{RRM}			-	19	-	A

Thermal Characteristics

Parameter	Symbol	Value		Unit
		TO-264	TO-247	
Thermal Resistance, Junction-to-Case,Max	$R_{th(J-C)}$	0.12	0.32	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient,Max	$R_{th(J-A)}$	30	52	

Ordering information

Marking	silk-screen	Package
MS100N60ICB3	MS100N60ICB3	TO-264
MS100N60ICC0	MS100N60ICC0	TO-247

Notes:

1:Pulse width limited by maximum junction temperature

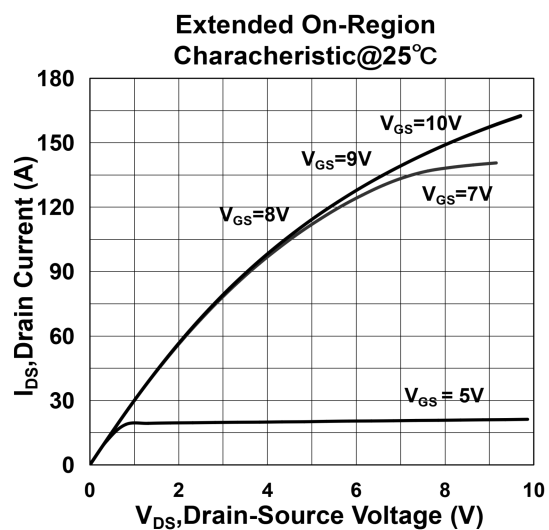
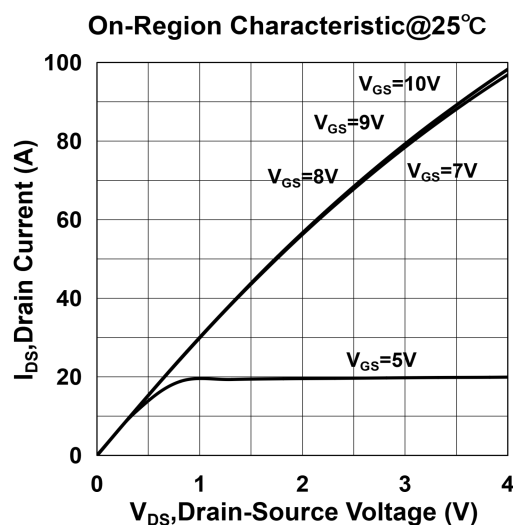
2:L=0.5mH, $I_{AS}=16A$, $V_{DD}=50V$,Starting $T_J=25^{\circ}C$

3: $I_{SD}\leq 10A$, $di/dt\leq 200A/us$, $V_{DD}\leq BV_{DSS}$,Starting $T_J=25^{\circ}C$

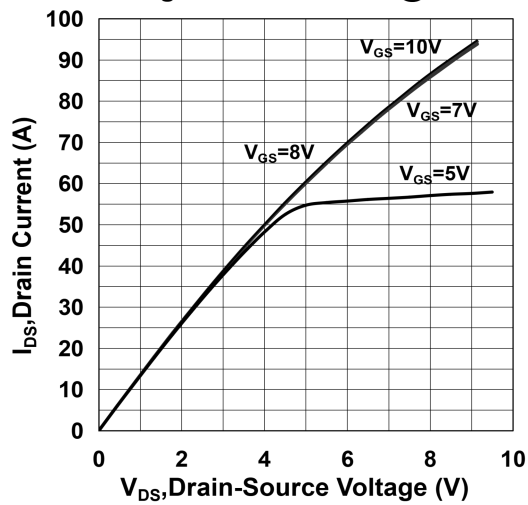
4:Pulse Test:Pulse Width $\leq 200us$,Duty Cycle $\leq 2\%$

5:Essentially independent of operating temperature

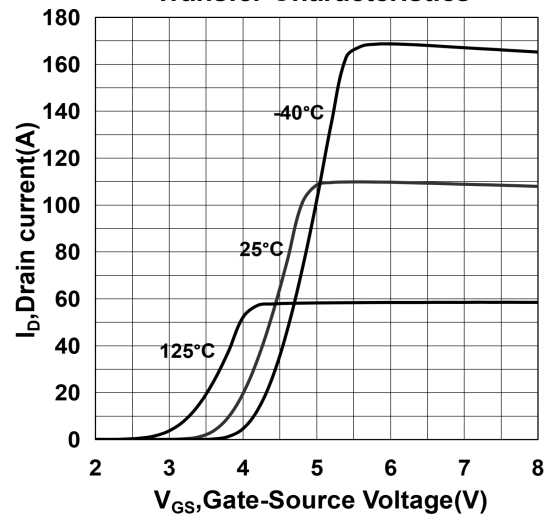
Electrical Characteristics Diagrams



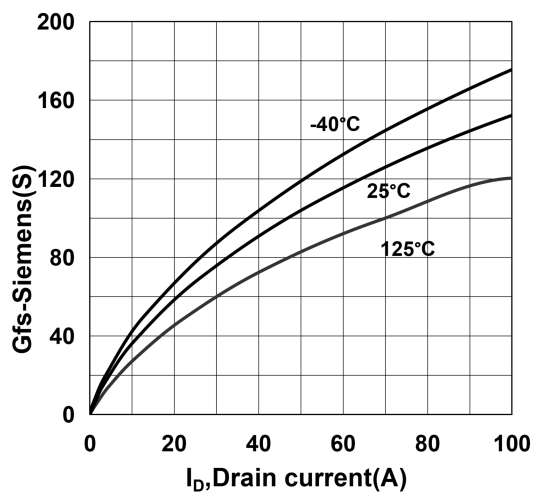
On-Region Characteristic@125°C



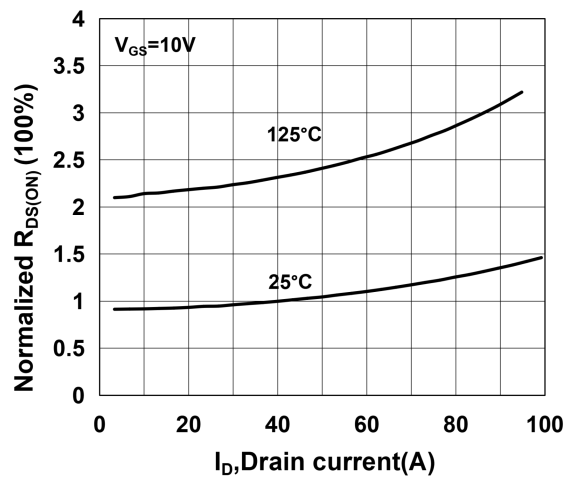
Transfer Characteristics



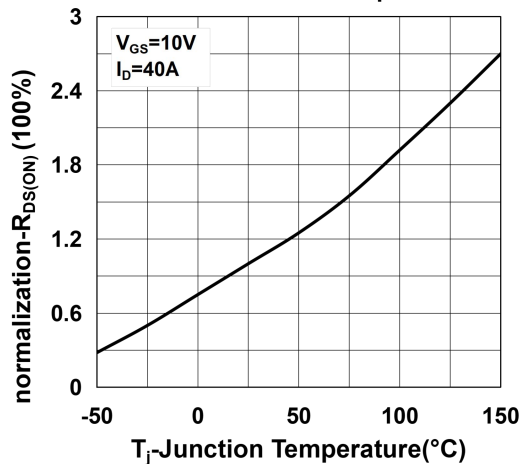
Transconductance



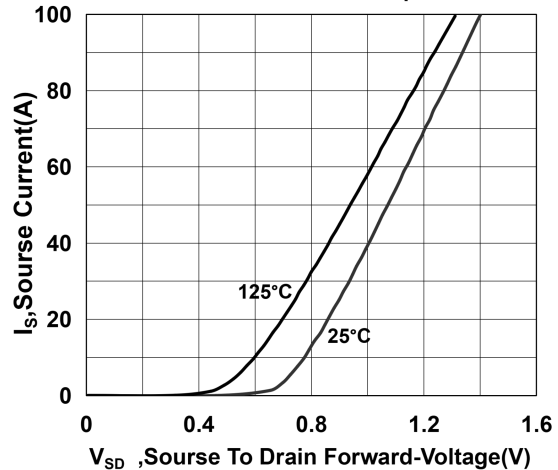
Normalized On-Resistance Variation vs Drain Current and Gate Voltage

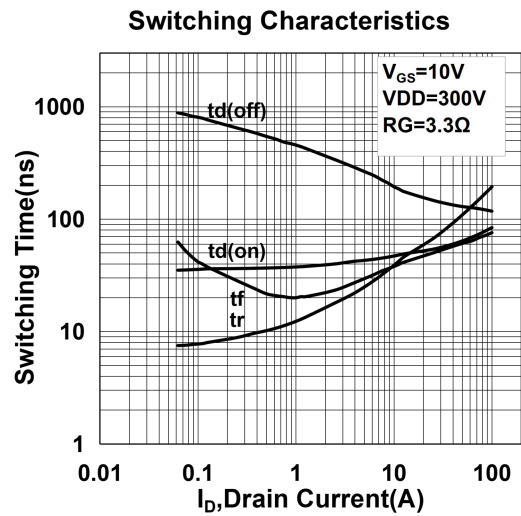
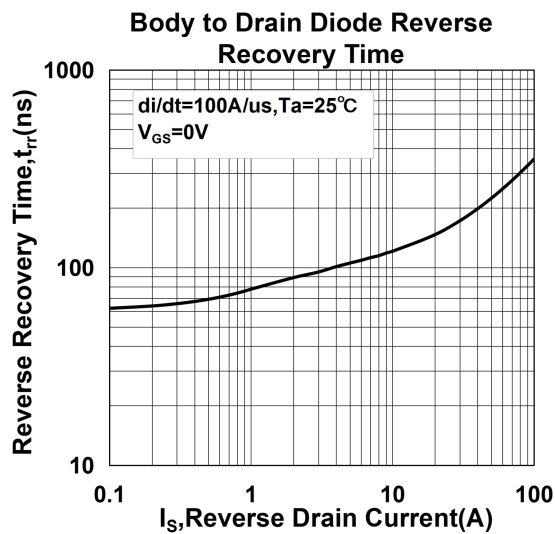
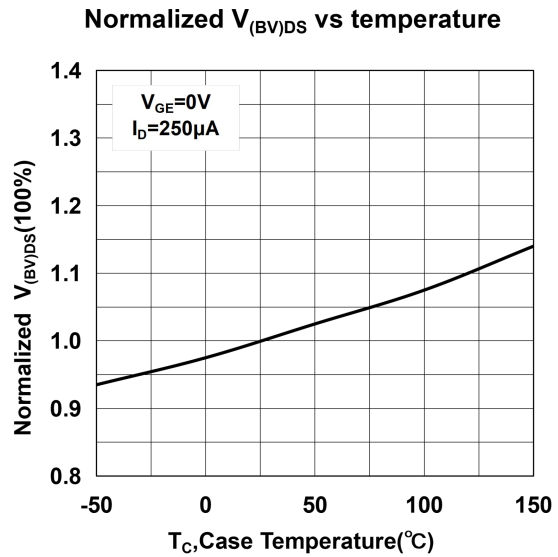
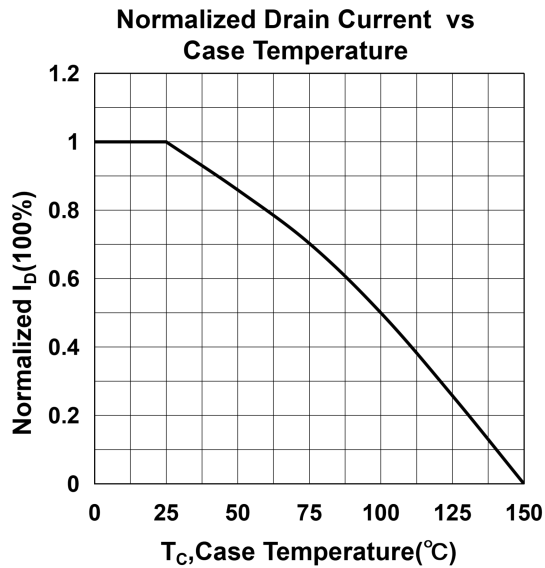
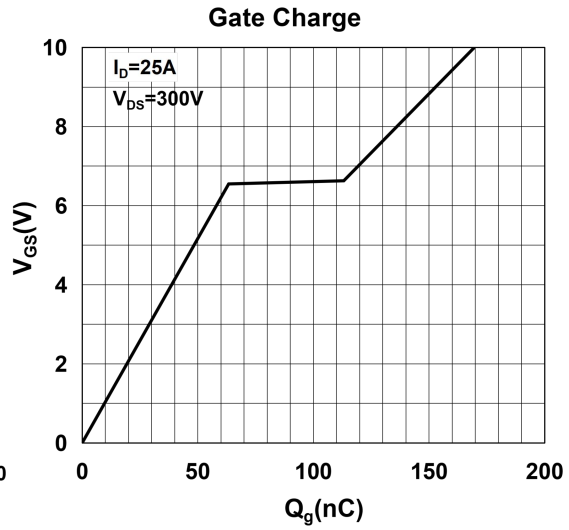
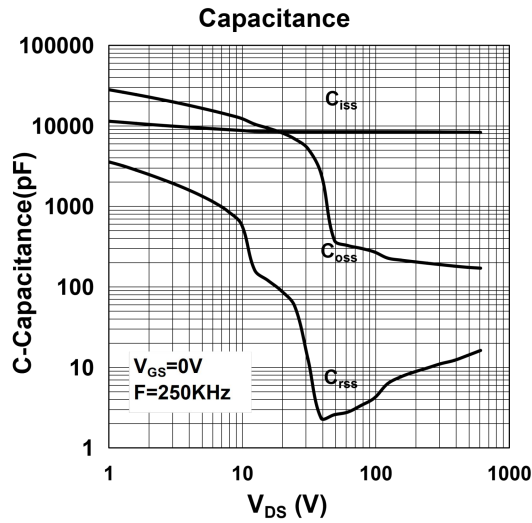


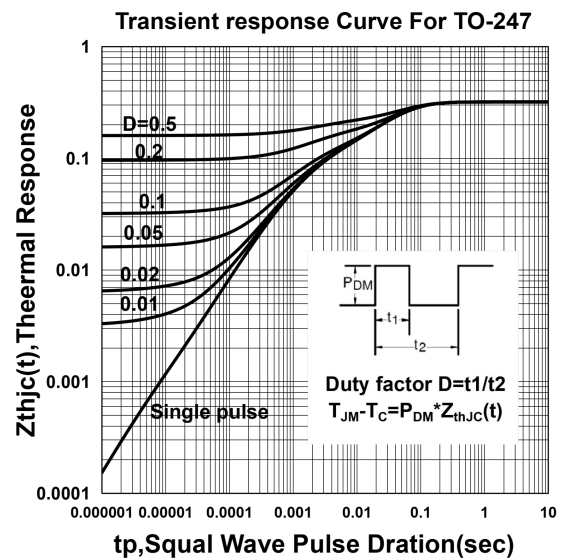
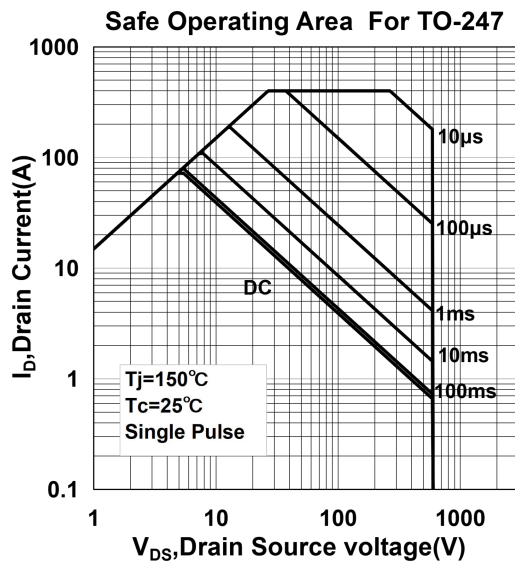
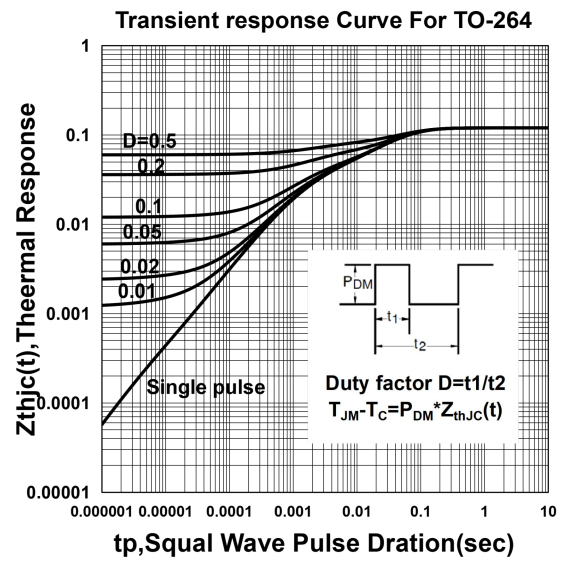
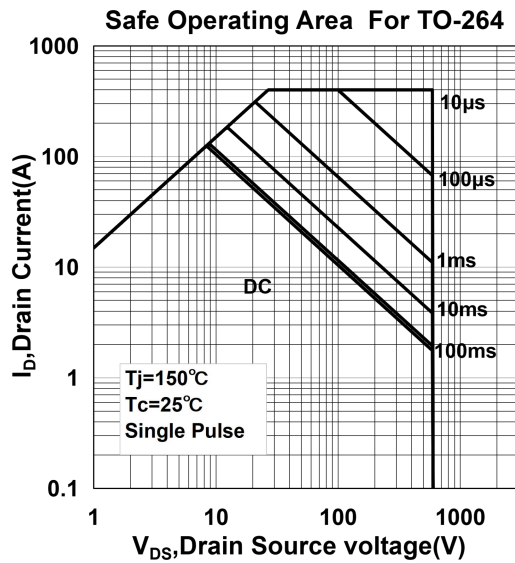
Normalization On-Resistance Variation vs Junction Temperature



Body Diode Forward Voltage Variation with Source Current and Temperature

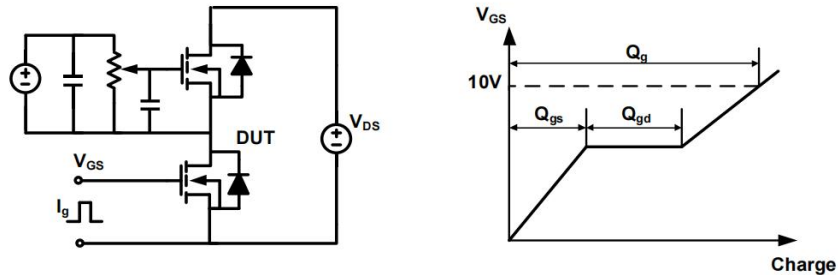




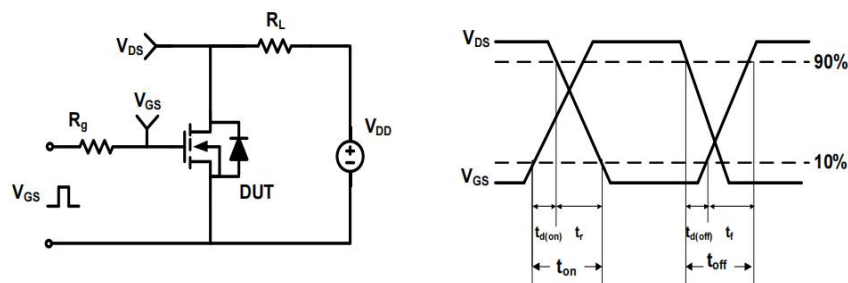


Test Circuit & Waveforms

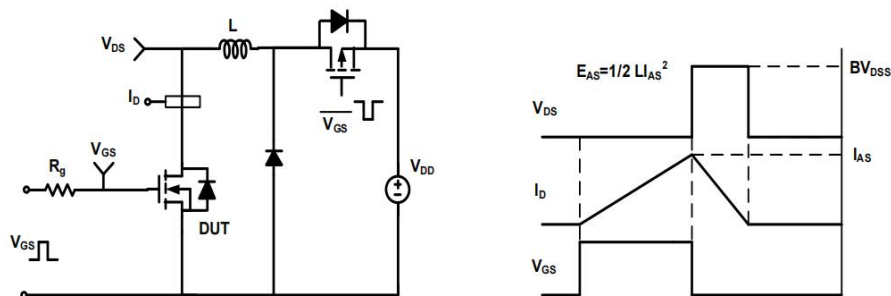
Gate Charge Test Circuit & Waveform



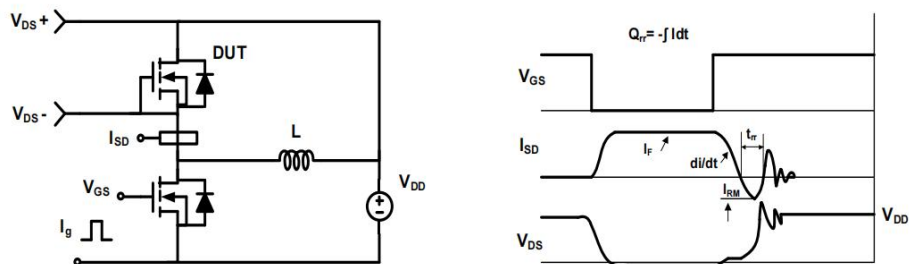
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



Package Mechanical DATA



TO-247

