REASUNOS

RS60R070W

Multi-Epi Super Junction MOSFETs

Lead Free Package and Finish

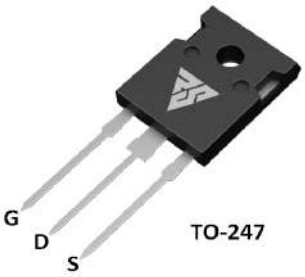
Applications:

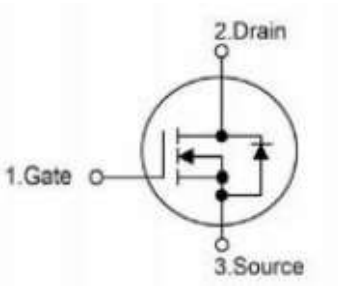
- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- PFC stages for server & telecom
- Motor Controls

I_D	$R_{DS(ON)}$(Typ.)	V_{DSS}
47A	60mΩ	600V

Features:

- New revolutionary high voltage technology
- Better RDS(on) in TO-247
- Ultra Low Gate Charge cause lower driving requirements
- Periodic avalanche rated
- Integrate fast recovery diode





Not to Scale

Ordering Information

Part Number	Package	Marking
RS60R070W	TO-247	RS60R070W

Absolute Maximun Ratings Tc=25℃ unless otherwise specified

Symbol	Parameter	RS60R070W	Units
V_{DSS}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current (TC = 25℃)	47	A
	Continuous Drain Current (TC = 100℃)	29	
I_{DM}	Pulsed Drain Current (Note*1)	140	
P_D	Power Dissipation(Tc=25℃)	391	W
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Engergy (Note*2)	1160	mJ
I_{AR}	Avalanche Current (Note*1)	10.0	A
E_{AR}	Repetitive Avalanche Engergy (Note*1)	1.72	mJ
T_L T_{PKG}	Maximum Temperature for Soldering Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds	300 260	℃
T_J and T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	

*Drain Current Limited by Maximum Junction Temperature

Caution:Stresses greater than those listed in the"Absolute Maximum Ratings"Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RS60R070W	Units	Test Conditions
RθJC	Junction-to-Case	0.32	℃/W	Drain lead soldered to water cooled heatsink,PD Adjusted for a peak junction temperature of +150℃.
RθJA	Junction-to-Ambient	62		1 cubic foot chamber,free air.

OFF Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-to-source Breakdown Voltage	600	--	--	V	VGS = 0V, ID = 250μA, TJ= 25℃
		--	600	--	V	VGS = 0V, ID = 250μA, TJ= 150℃
IDSS	Drain-to-Source Leakage Current	--	--	3.0	μA	VDS=600V,VGS=0V
IGSS	Gate-to-Source Forward Leakage	--	--	100	nA	VGS=+30V VDS=0V
	Gate-to-Source Reverse Leakage	--	--	-100		VGS=-30V VDS=0V

ON Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain-to-Source On-Resistance	--	60	75	mΩ	VGS=10V,ID=23A
VGS(TH)	Gate Threshold Voltage	2.0	--	4.0	V	VGS=VDS,ID=250μA
g_{FS}	Forward Transconductance	--	30	--	S	VDS = 40V, ID = 25A

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn-on Delay Time	--	19	--	ns	VDS=480V ID=23A RG=20Ω VGS=10V
trise	Rise Time	--	10	--		
td(OFF)	Turn-OFF Delay Time	--	87			
tfall	Fall Time	--	5			

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	3100	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	148	--		
Crss	Reverse Transfer Capacitance	--	5	--		
Qg	Total Gate Charge	--	190	--	nC	VDS=480V ID=23A VGS=10V
Qgs	Gate-to-Source Charge	--	30	--		
Qgd	Gate-to-Drain("Miller"）Charge	--	95	--		

Source-Drain Diode Characteristics

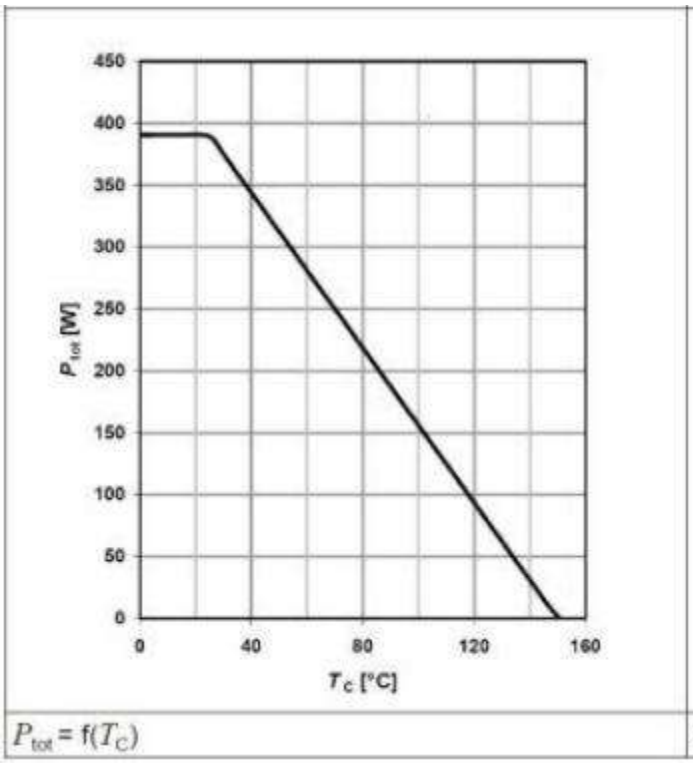
Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	47	A	Integral pn-diode in MOSFET
ISM	Maximum Pulsed Current	--	--	140	A	
VSD	Diode Forward Voltage	--	0.9	1.5	V	IS=23A,VGS=0V Tj=25℃
trr	Reverse Recovery Time	--	210	--	nS	VGS=0V IS=23A,di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	2.5	--	μC	

Notes:

*1.Repetitive rating;pulse width limited by maximum junction temperature.
*2. Pulse width tp limited by Tj,max

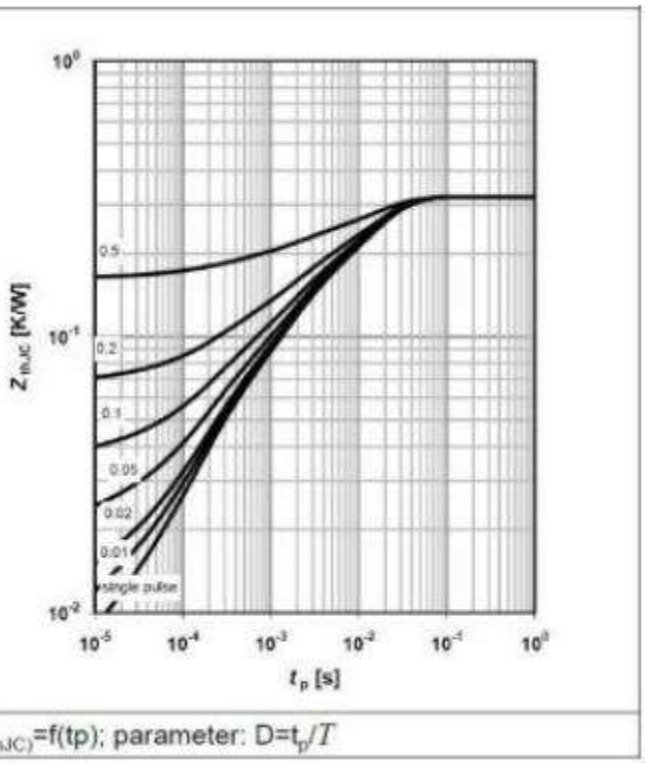
Typical Feature curve T_J=25℃, unless otherwise noted

Fingure1. Power dissipation



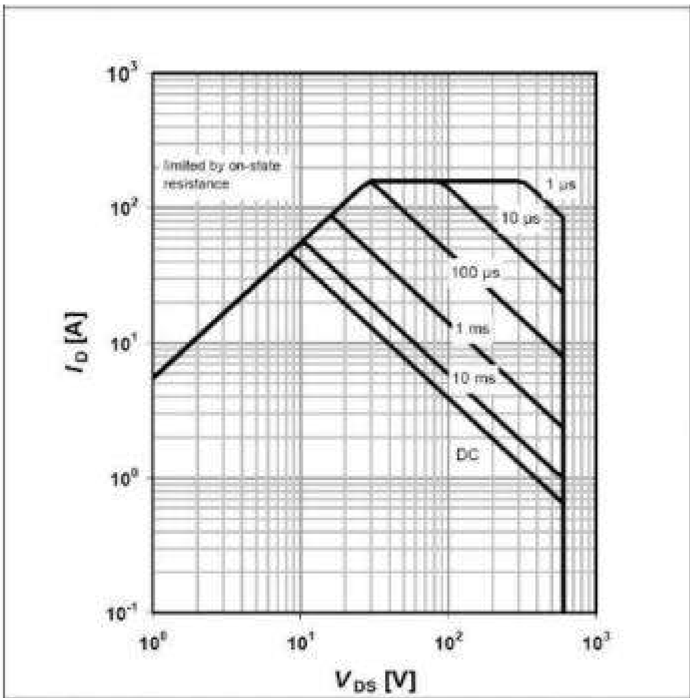
$P_{tot} = f(T_C)$

Fingure2. Max. transient thermal impedance



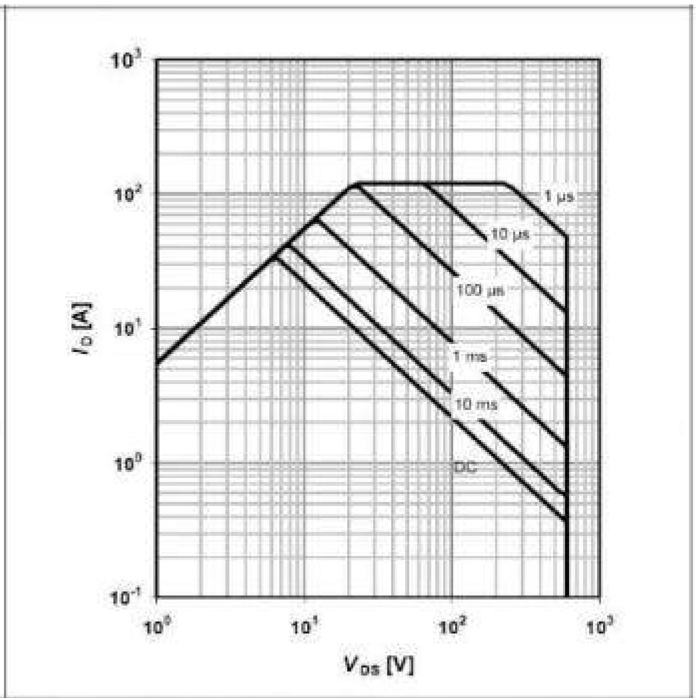
$Z_{(thJC)}$=f(tp); parameter: D=t_p/T

Fingure3. Safe operating areaTc=25℃



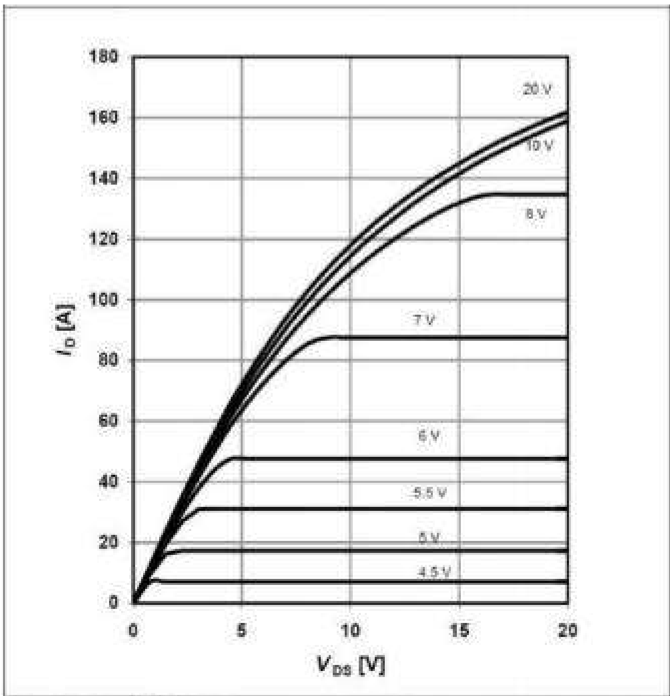
I_D=f(V_{DS}); T_C=25 °C; V_{GS} > 7V; D=0; parameter t_p

Fingure4. Safe operating areaTc=80℃



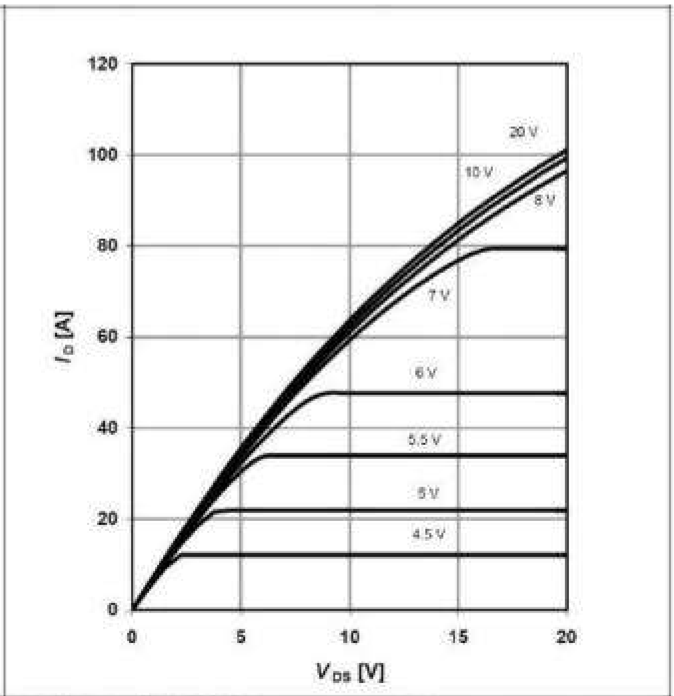
I_D=f(V_{DS}); T_C=80°C; V_{GS} > 7V; D=0; parameter t_p

Fingure5. Output characteristics Tj=25℃



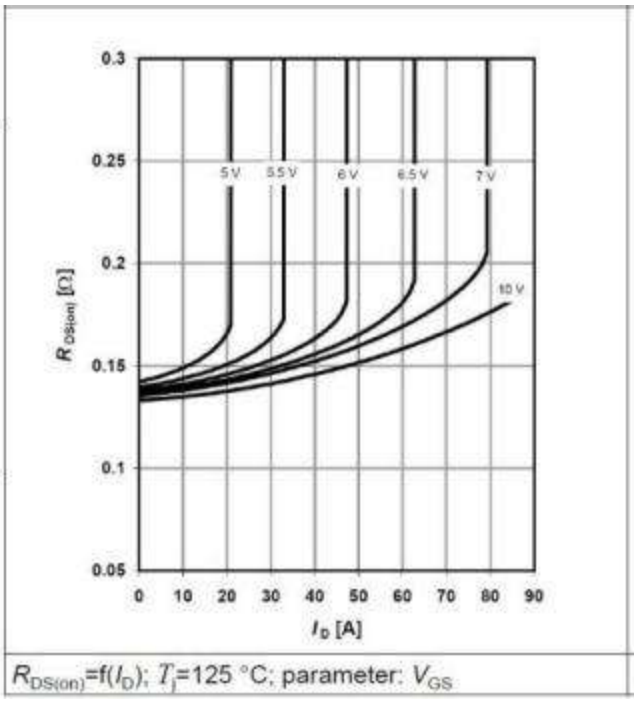
I_D=f(V_{DS}); T_j=25 °C; parameter: V_{GS}

Fingure6. Output characteristics Tj=125℃



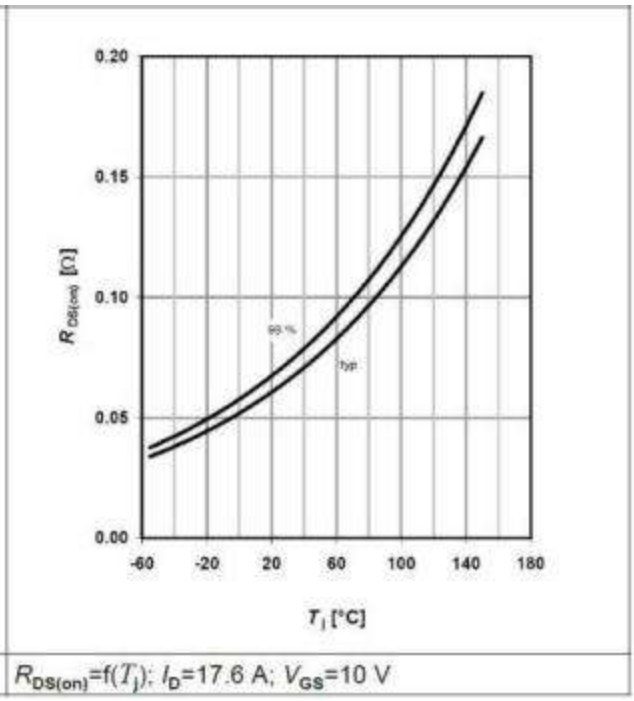
I_D=f(V_{DS}); T_j=125 °C; parameter: V_{GS}

Fingure7. Type drain-source on state resistance



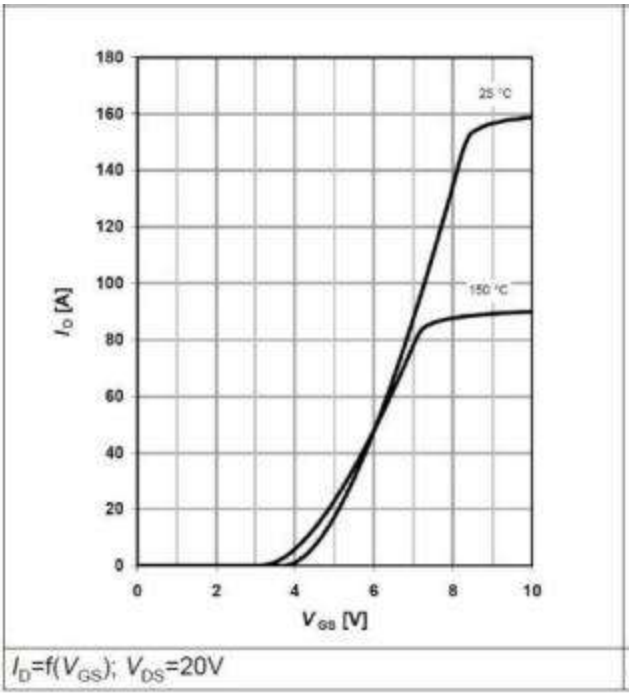
$R_{DS(on)}$=f(I_D); T_j=125 °C; parameter: V_{GS}

Figure8. Typ. drain-source on state resistance



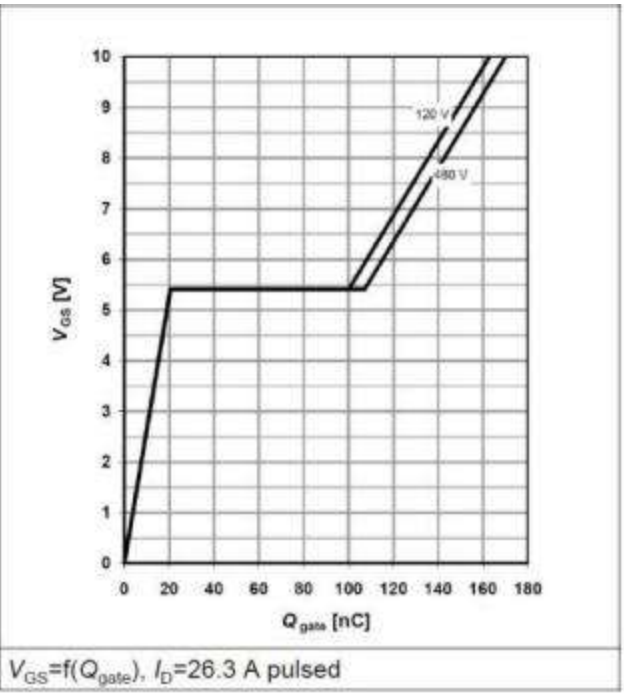
$R_{DS(on)}$=f(T_j); I_D=17.6 A; V_{GS}=10 V

Fingure9. Typ. transfer characteristics



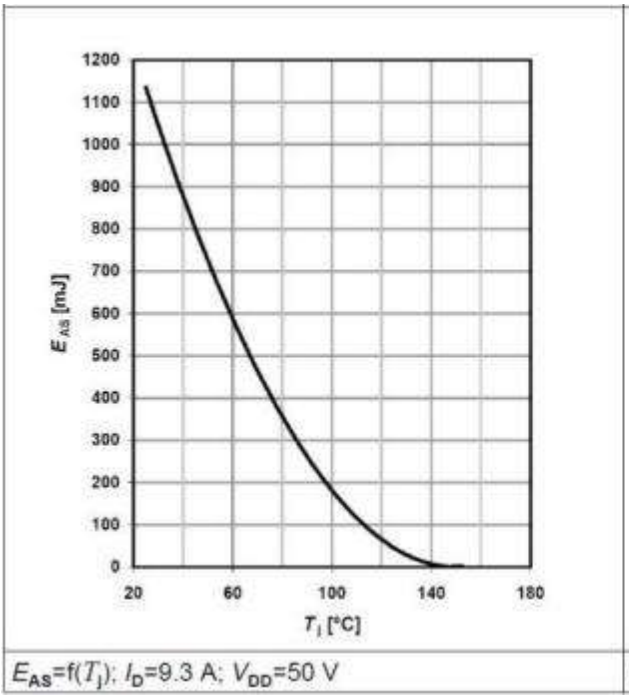
I_D=f(V_{GS}); V_{DS}=20V

Figure10. Gate charge



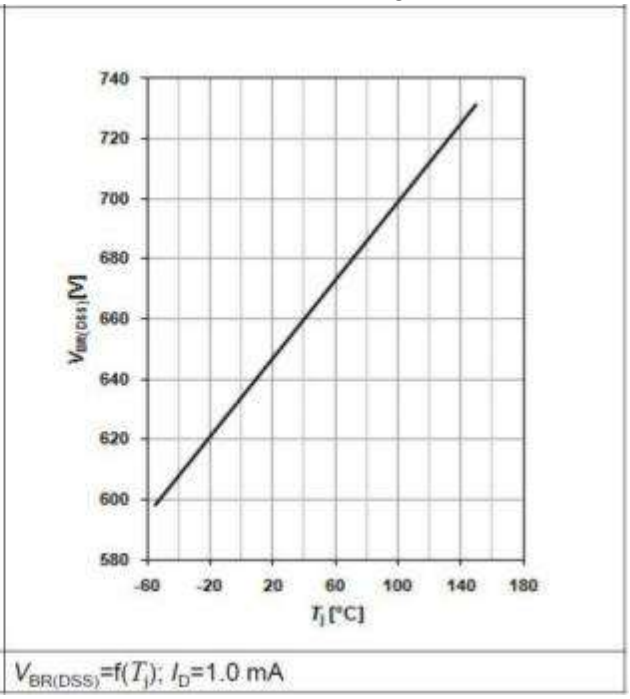
V_{GS}=f(Q_{gate}); I_D=26.3 A pulsed

Fingure11. Avalanche energy



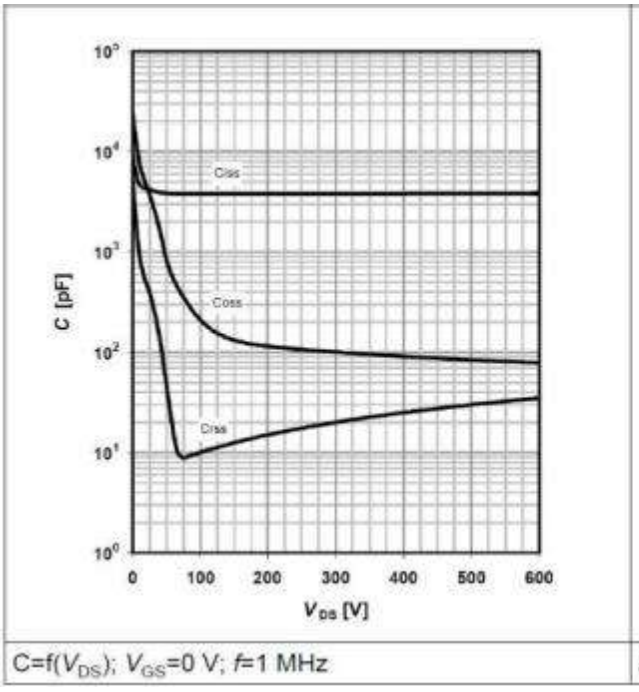
E_{AS}=f(T_j); I_D=9.3 A; V_{DD}=50 V

Fingure12. Drain-source breakdown voltage



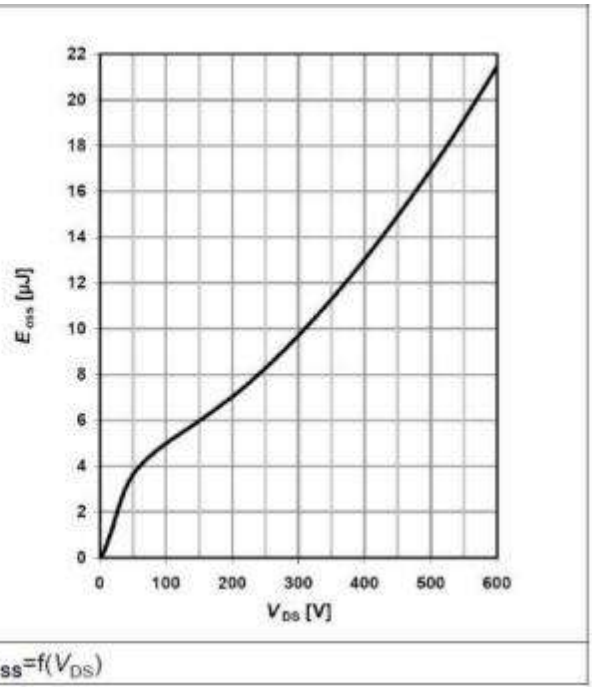
$V_{BR(DSS)}$=f(T_j); I_D=1.0 mA

Fingure13. Typ. Capacitances



C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

Fingure14. Coss stored energy



E_{OSS}=f(V_{DS})

Test Circuits and Waveforms

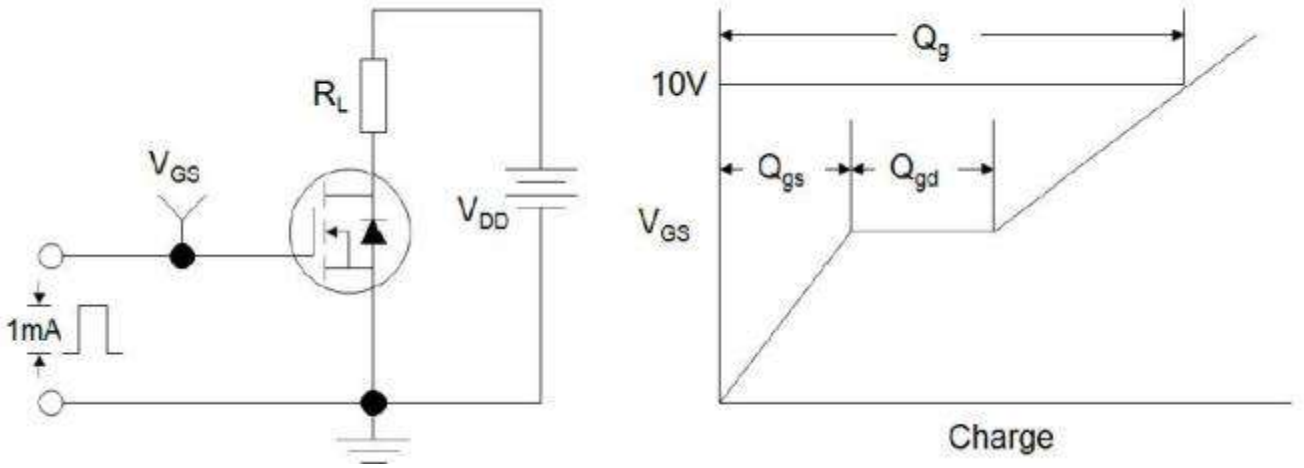


Figure A.
Gate Charge Test Circuit and Waveform

#
#

#

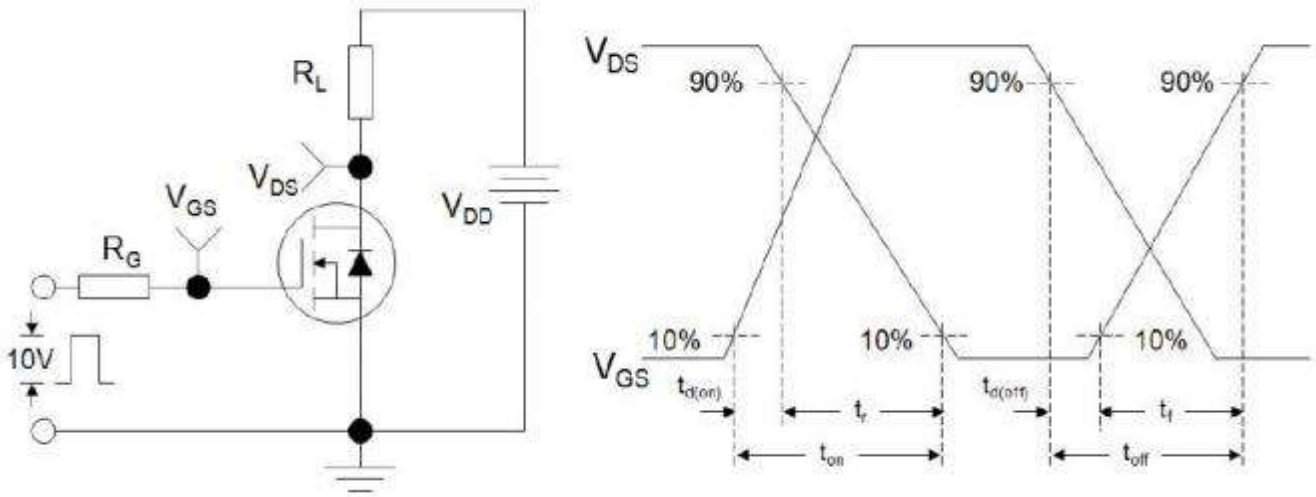


Figure B.
Resistive Switching Test Circuit and Waveform

Test Circuits and Waveforms

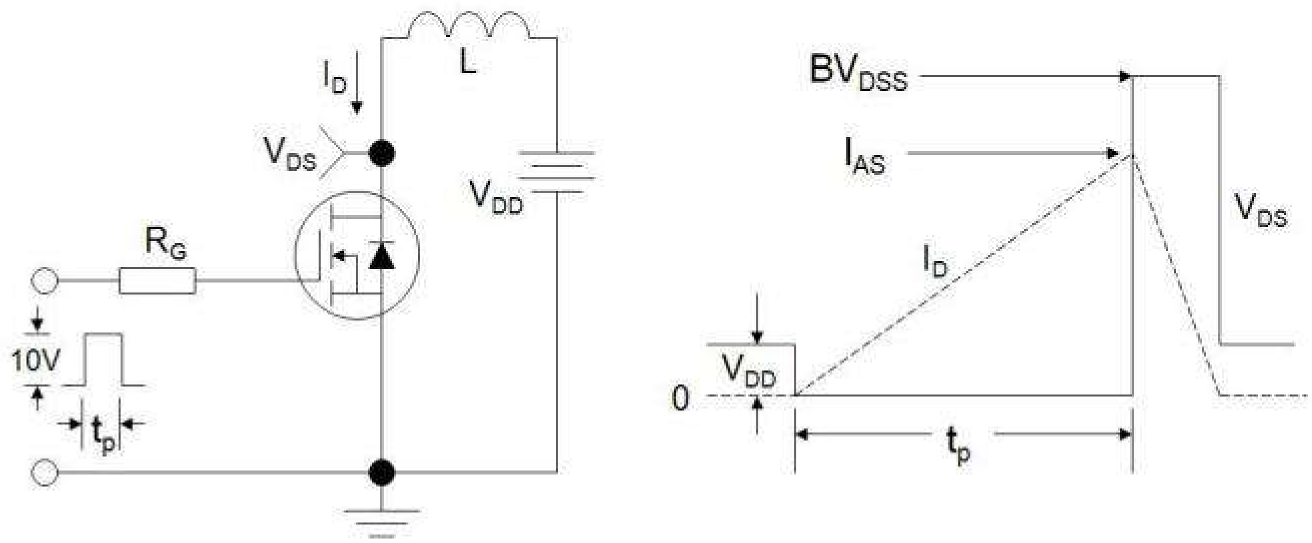
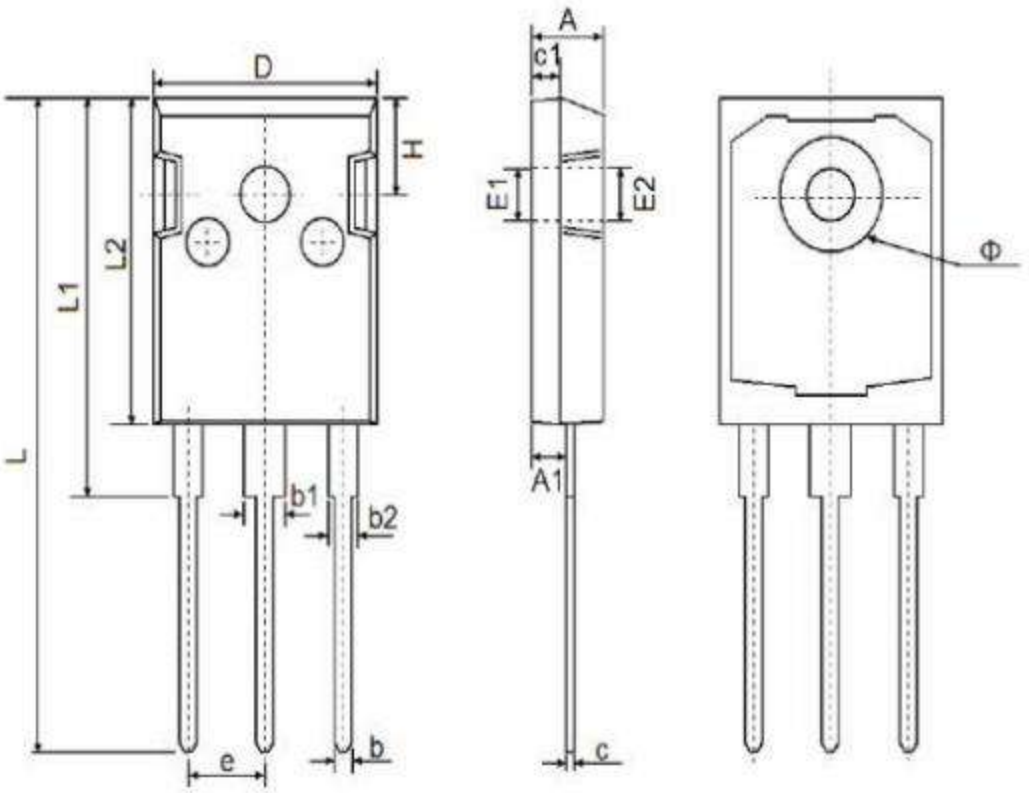


Figure C.Unclamped Inductive Switching Test Circuit and Waveform

Package outline drawing

Unit:mm



TO-247

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	

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