



Lead Free Package and Finish

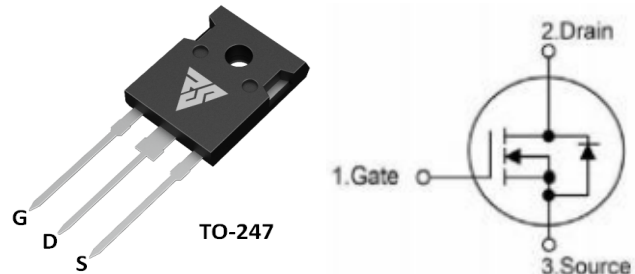
Applications:

- 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	60m Ω	600V

Features:

- New revolutionary high voltage technology
- Better $R_{DS(on)}$ 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 Maximum Ratings $T_c=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	RS60R070W	Units
V_{DSS}	Drain-to-Source Voltage	600	V
I_D	Continuous Drain Current ($T_C = 25^{\circ}\text{C}$)	47	A
	Continuous Drain Current ($T_C = 100^{\circ}\text{C}$)	29	
I_{DM}	Pulsed Drain Current (Note*1)	140	
PD	Power Dissipation($T_c=25^{\circ}\text{C}$)	303	W
VGS	Gate-to-Source Voltage	± 30	V
EAS	Single Pulse Avalanche Energy (Note*2)	900	mJ
IAR	Avalanche Current (Note*1)	10.0	A
EAR	Repetitive Avalanche Energy (Note*1)	1.72	mJ
TL TPKG	Maximum Temperature for Soldering	300 260	$^{\circ}\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds		
	Package Body for 10 seconds		
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
$R_{\theta JC}$	Junction-to-Case	0.32	$^{\circ}\text{C}/\text{W}$	Drain lead soldered to water cooled heatsink ,PD Adjusted for a peak junction temperature of $+150^{\circ}\text{C}$.
$R_{\theta JA}$	Junction-to-Ambient	62		1 cubic foot chamber ,free air.

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV _{DSS}	Drain-to-source Breakdown Voltage	600	--	--	V	V _{GS} = 0V, I _D = 250 μ A, T _J = 25 $^{\circ}$ C
		--	600	--	V	V _{GS} = 0V, I _D = 250 μ A, T _J = 150 $^{\circ}$ C
ID _{SS}	Drain-to-Source Leakage Current	--	--	3.0	μ A	V _D S=600V, V _G S=0V
IG _{SS}	Gate-to-Source Forward Leakage	--	--	100	nA	V _G S=+30V V _D S=0V
	Gate-to-Source Reverse Leakage	--	--	-100		V _G S=-30V V _D S=0V

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R _{DS(on)}	Static Drain-to-Source On-Resistance	--	60	75	m Ω	V _G S=10V, I _D =23A
V _{GS(TH)}	Gate Threshold Voltage	2.0	--	4.5	V	V _G S=V _D S, I _D =250 μ A
g _{FS}	Forward Transconductance	--	30	--	S	V _D S = 40V, I _D = 25A

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
t _{d(ON)}	Turn-on Delay Time	--	19	--	ns	V _D S=480V I _D =23A R _G =20 Ω V _G S=10V
t _{rise}	Rise Time	--	10	--		
t _{d(OFF)}	Turn-OFF Delay Time	--	87	--		
t _{fall}	Fall Time	--	5	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
C _{iss}	Input Capacitance	--	3100	--	pF	V _G S=0V V _D S=25V f=1.0MHz
C _{oss}	Output Capacitance	--	148	--		
C _{rss}	Reverse Transfer Capacitance	--	5	--		
Q _g	Total Gate Charge	--	190	--	nC	V _D S=480V I _D =23A V _G S=10V
Q _{gs}	Gate-to-Source Charge	--	30	--		
Q _{gd}	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°C
trr	Reverse Recovery Time	--	210	--	nS	VGS=0V
Qrr	Reverse Recovery Charge	--	2.5	--	μC	IS=23A, di/dt=100A/μs

Notes:

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

Typical Feature curve Tj=25°C, unless otherwise noted

Figure1. Power dissipation

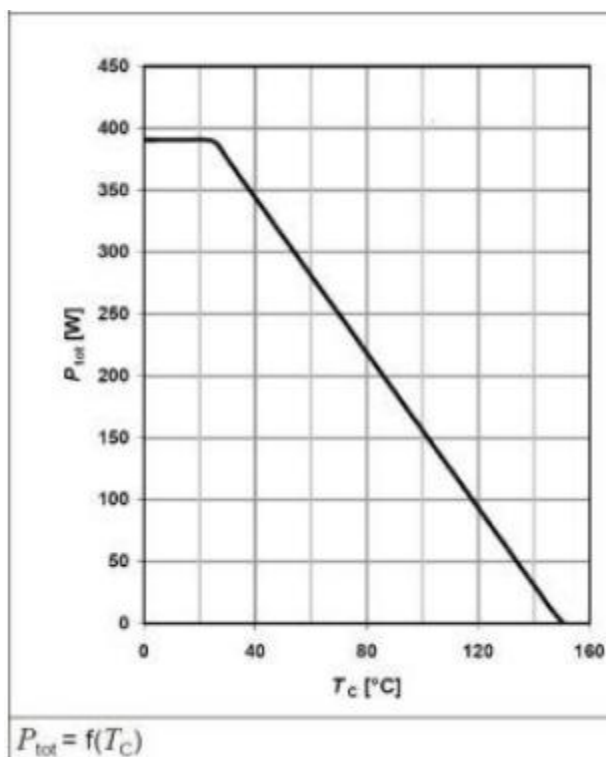


Figure2. Max. transient thermal impedance

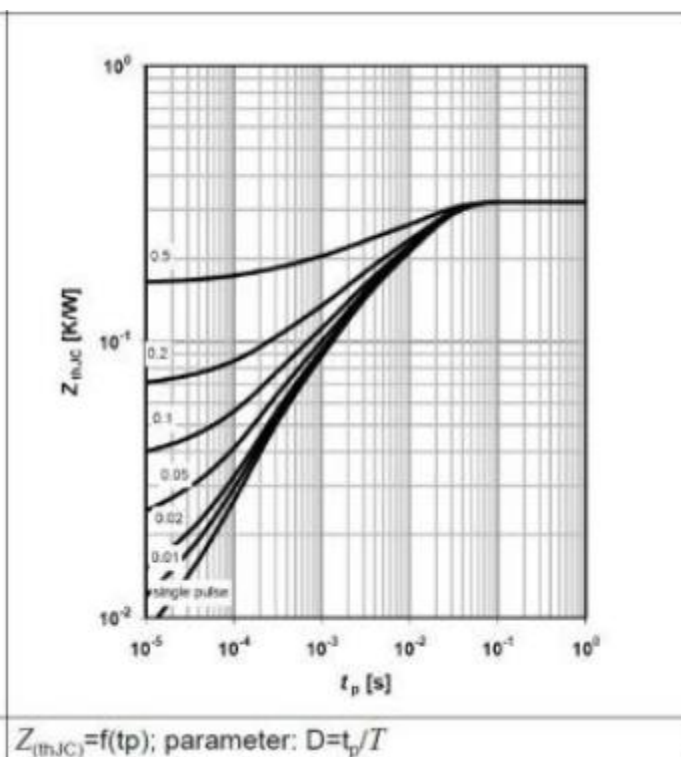


Figure3. Safe operating area $T_c=25^\circ\text{C}$

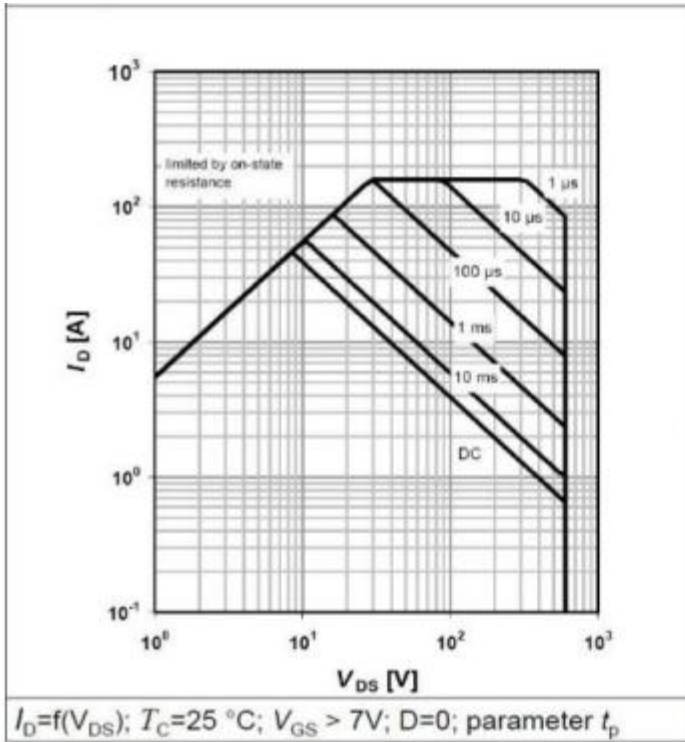


Figure4. Safe operating area $T_c=80^\circ\text{C}$

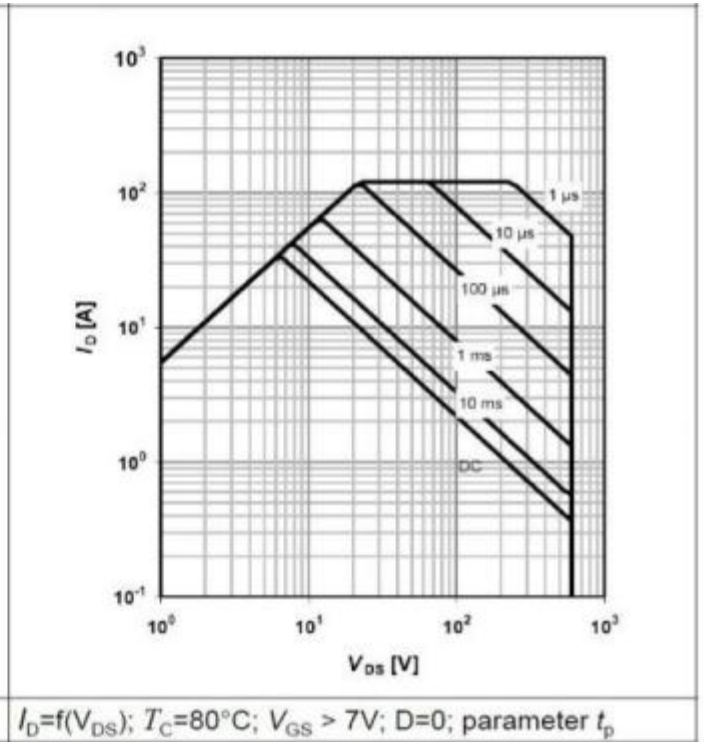


Figure5. Output characteristics $T_j=25^\circ\text{C}$

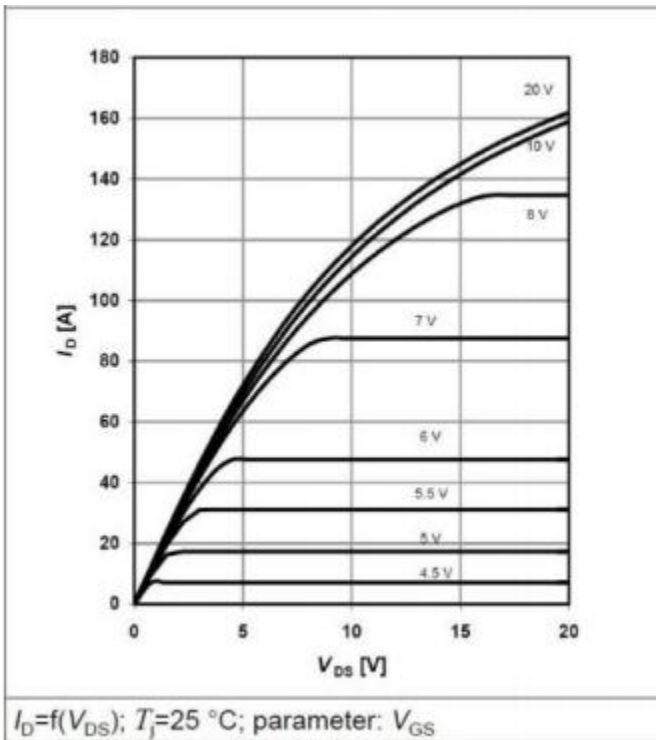


Figure6. Output characteristics $T_j=125^\circ\text{C}$

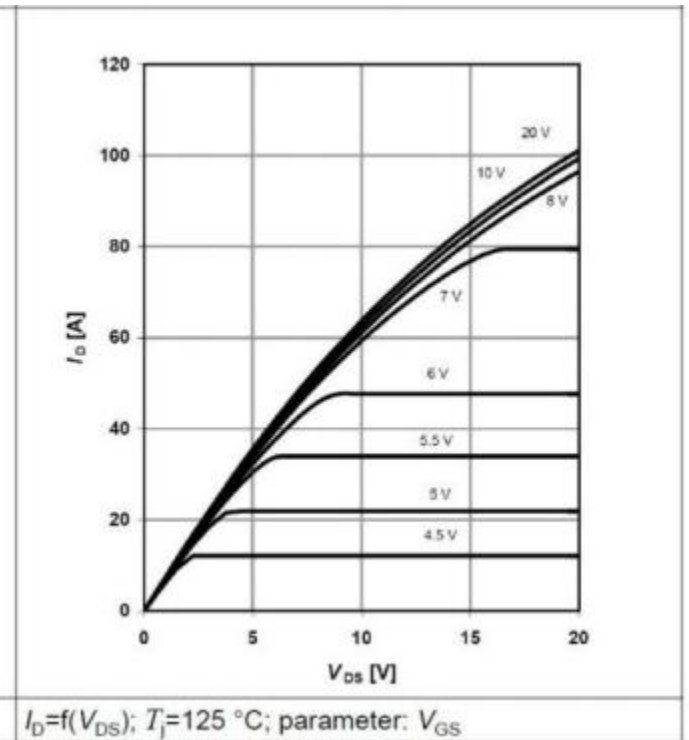


Figure7. Type drain-source on state resistance

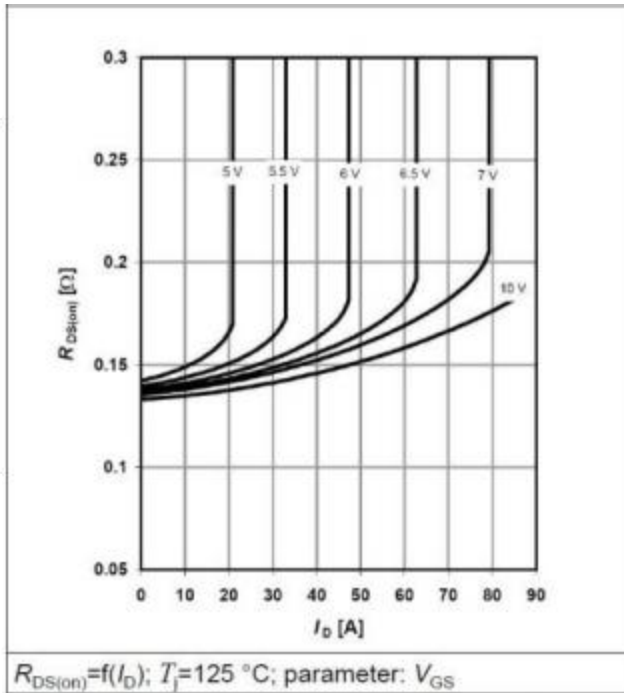


Figure8. Typ. drain-source on state resistance

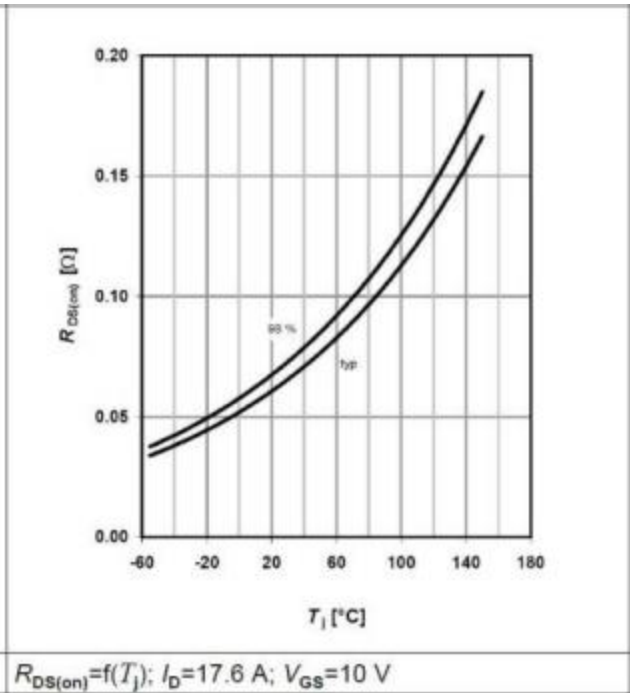


Figure9. Typ. transfer characteristics

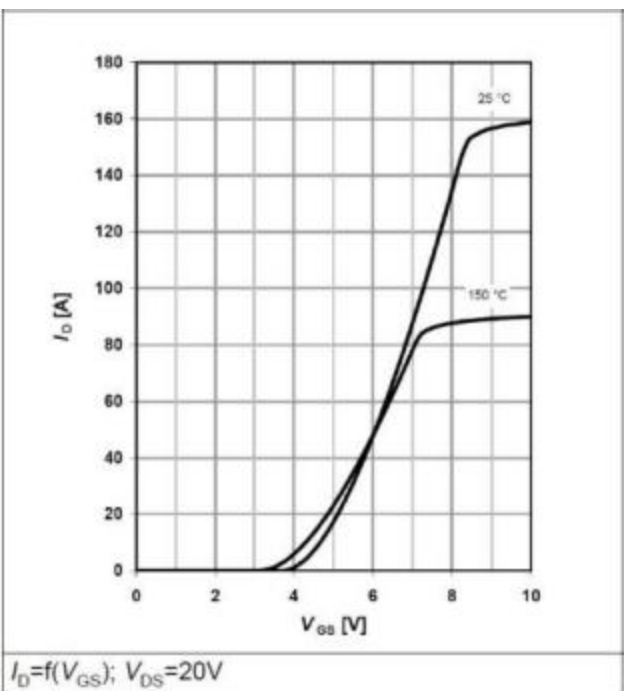


Figure10. Gate charge

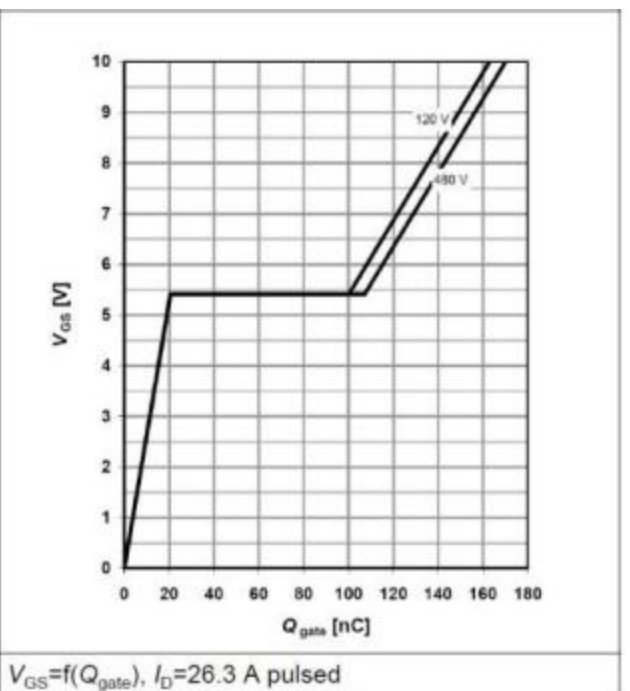


Figure11. Avalanche energy

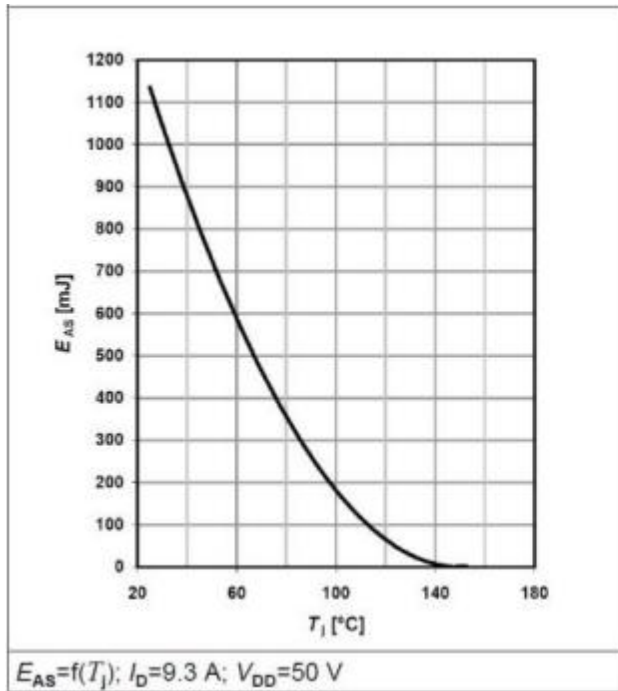


Figure12. Drain-source breakdown voltage

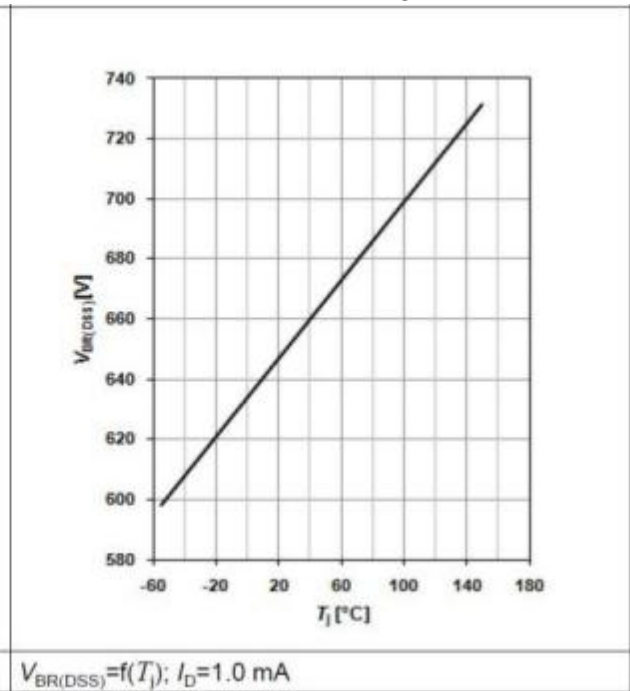


Figure13. Typ. Capacitances

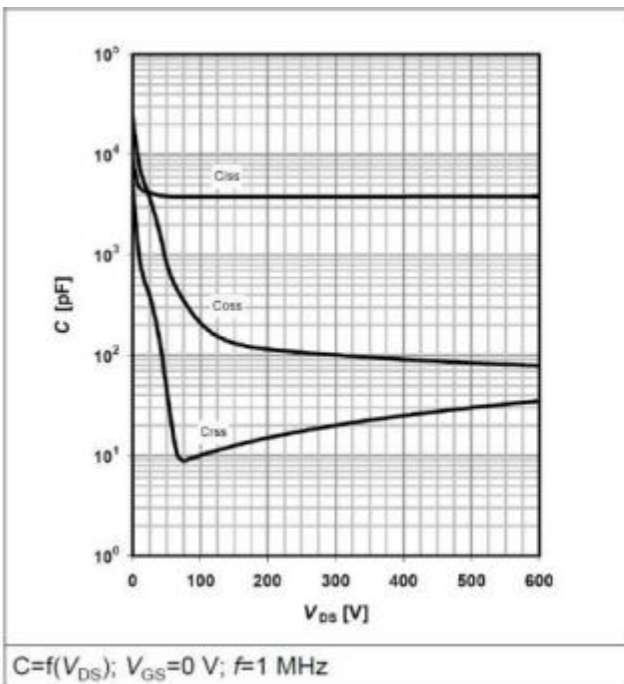
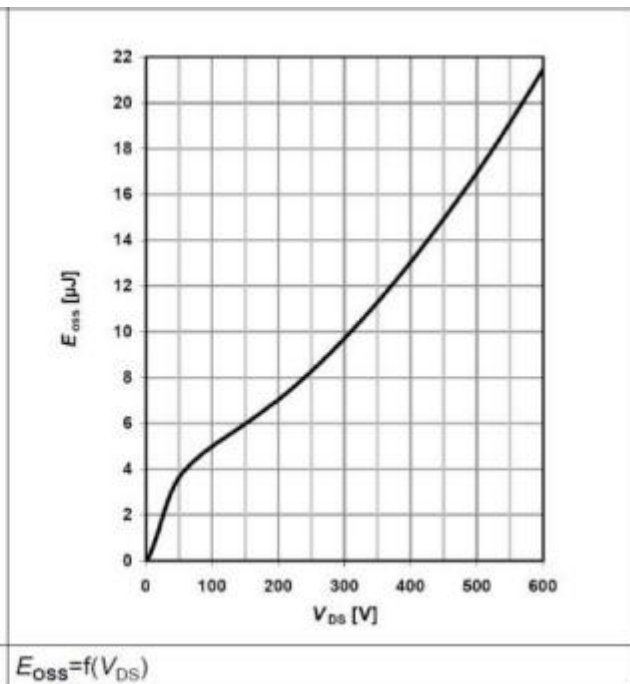


Figure14. Coss stored energy



Test Circuits and Waveforms

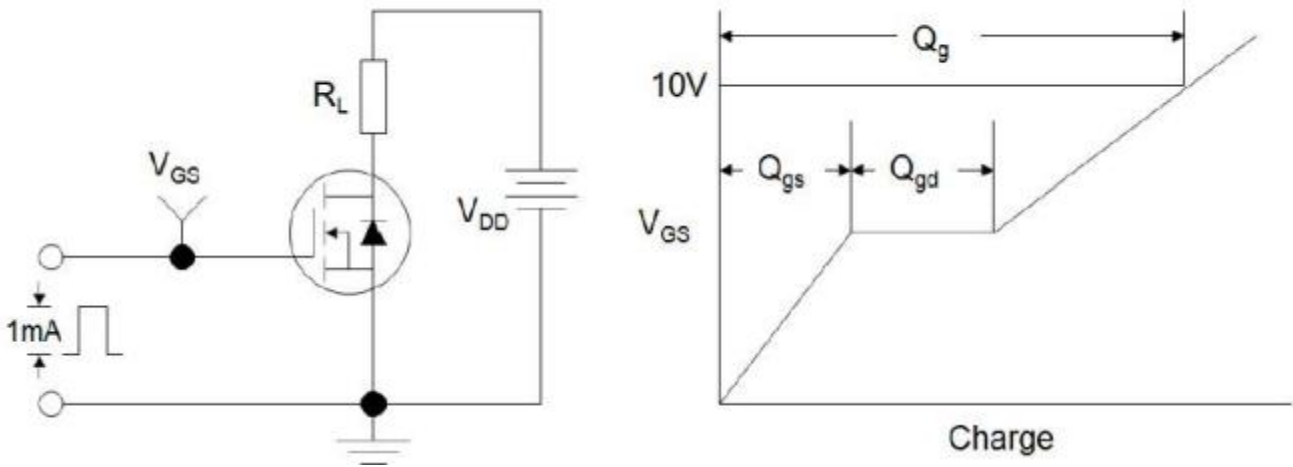


Figure A.
Gate Charge Test Circuit and Waveform

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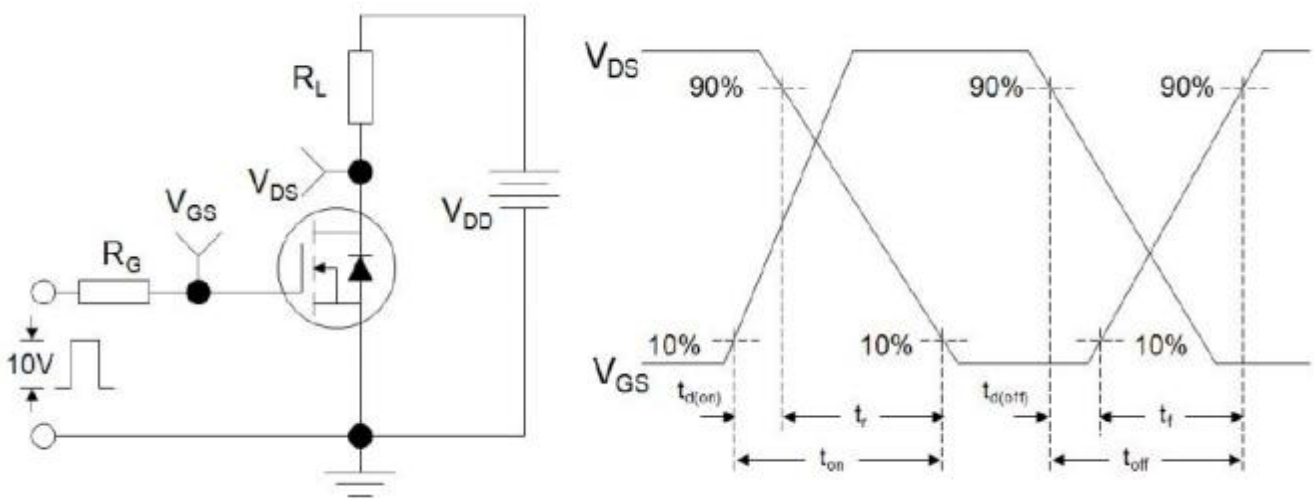


Figure B.
Resistive Switching Test Circuit and Waveform

Test Circuits and Waveforms

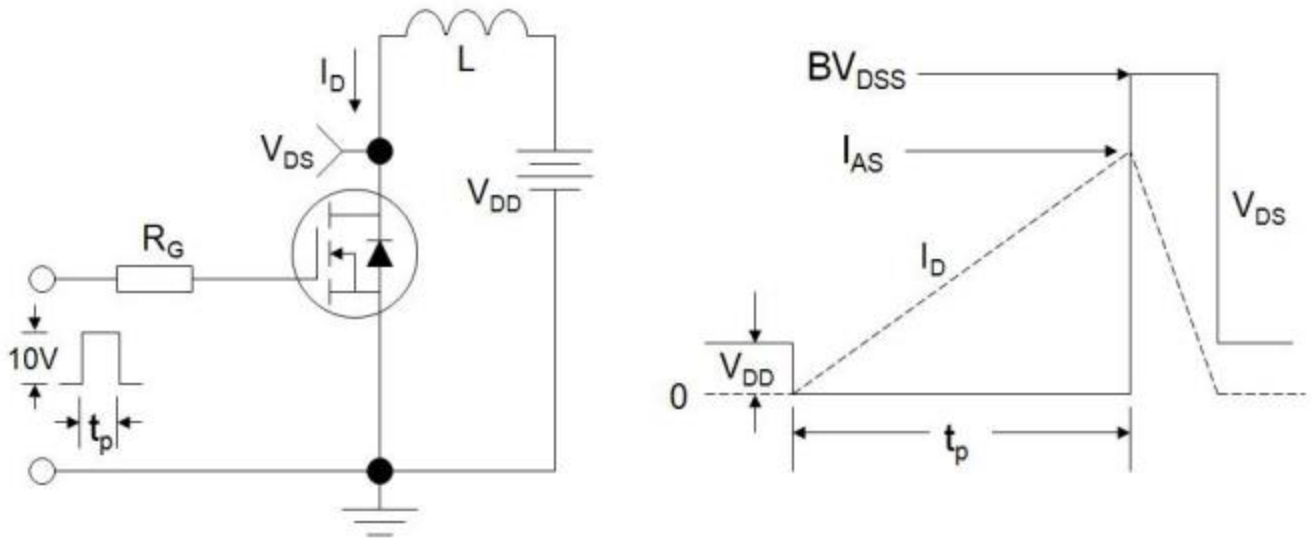
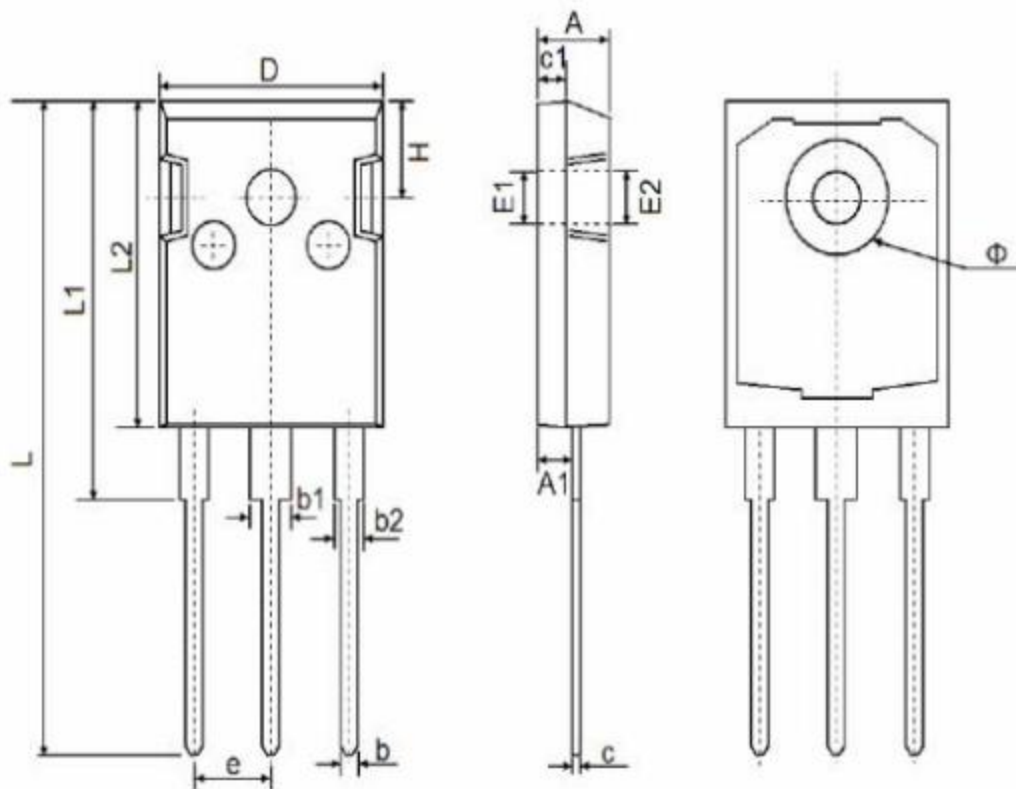


Figure C. Unclamped Inductive Switching Test Circuit and Waveform

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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