Features

- Higher System Efficiency
- Reduced Cooling Requirements
- 175°C operating temperature
- Increased Power Density
- Increased System Switching Frequency

Key Parameters

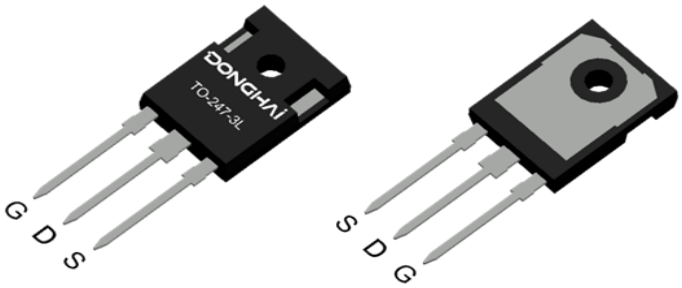
V_{DS}	1200V
$R_{DS(on)typ}$	16mΩ
I_D	110A
Vth	2.5V

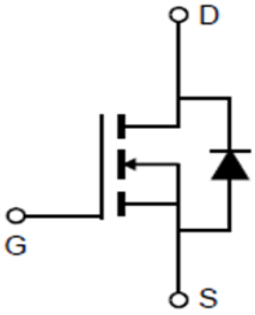
Applications

- Solar and UPS inverters
- Power Supplies
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Pulsed Power applications

Pb LEAD FREE Hal Halogen FREE RoHS COMPLIANT

TO-247-3





Marking & Packing Information

Part #	Package	Marking	Tube/Reel	Qty(pcs)
DCC016M120G3	TO-247-4	DCC016M120G3	Tube	240/box

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage（VGS=0V, ID=100μA）	V_{DS}	1200	V
Gate-Source voltage	V_{GSmax}	-8/+22	V
Recommend Gate-Source Voltage	V_{GSop}	-4/+18	V
Continuous drain current（VGS=18V） TC = 25°C TC = 25°C(Package limit) TC = 100°C	I_D	 110 160 78	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	314	A
Power dissipation (T_C = 25°C)	P_{tot}	556	W
Operating junction and storage temperature	T_j , T_{stg}	-55~+175	°C

Thermal Resistance

Parameter	Symbol	typ	Unit
Thermal resistance, junction – case	R_{thJC}	0.27	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	34	

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

Static Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Drain-source breakdown voltage	BV_{DSS}	1200	-	-	V	V_{GS}=0V, I_D=100μA
Gate threshold voltage	$V_{GS(th)}$	2.0 -	2.5 1.8	3.0 -	V	V_{DS}=V_{GS},I_D=20mA T_j=25°C T_j=175°C
Zero gate voltage drain current	I_{DSS}	- -	- -	100 250	μA	V_{DS}=1200V,V_{GS}=0V T_j=25°C T_j=175°C
Gate-source leakage current	I_{GSS}	-	-	250	nA	V_{GS}=-8/22V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	16 31	21 -	mΩ	V_{GS}=18V, I_D=50A T_j=25°C T_j=175°C
Transconductance	g_{fs}	- -	16.3 15.7	- -	S	V_{DS}=20V,I_D=50A T_j=25°C T_j=175°C

Dynamic Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Input Capacitance	C_{iss}	-	3064	-	pF	V_{GS}=0V, V_{DS}=1000V, f=1MHz
Output Capacitance	C_{oss}	-	180	-		
Reverse Transfer Capacitance	C_{rss}	-	16.8	-		
Gate Total Charge	Q_G	-	158	-	nC	V_{GS}=-4/18V, V_{DS}=800V, I_D=50A, f=1MHz
Gate-Source charge	Q_{gs}	-	37	-		
Gate-Drain charge	Q_{gd}	-	34	-		
Turn-on delay time	$t_{d(on)}$	-	32	-	ns	V_{DS}=800V, V_{GS}=-4V/18V, I_D=50A, $R_{G(ext)}$=2.5Ω, L=100μH
Rise time	t_r	-	36	-		
Turn-off delay time	$t_{d(off)}$	-	53	-		
Fall time	t_f	-	15	-		
Internal Gate Resistance	$R_{G(int)}$	-	3.4	-	Ω	f=1MHz,V_{AC}=25mV
Turn-On Switching Energy	E_{ON}	-	1415	-	μJ	V_{DS}=800V, V_{GS}=-4V/18V, I_D=50A, $R_{G(ext)}$=2.5Ω, L=100μH
Turn-Off Switching Energy	E_{OFF}	-	478	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode Max Current	I_S	-	-	110	A	-
Diode Forward Voltage	V_{SD}	-	3.4	-	V	V_{GS}=-4V,I_{SD}=25A Tj=25°C
		-	3.0	-		Tj=175°C
Diode Reverse Recovery Time	t_{rr}	-	21.7	-	ns	VR=800V, I_{SD}=50A, dI/dt=1000A/μs
Diode Reverse Recovery Charge	Q_{rr}	-	170	-	nC	
Peak Reverse Recovery Current	I_{rrm}	-	13	-	A	

Typical Characteristics Diagram

Fig1. Output Characteristics Tj = 25℃

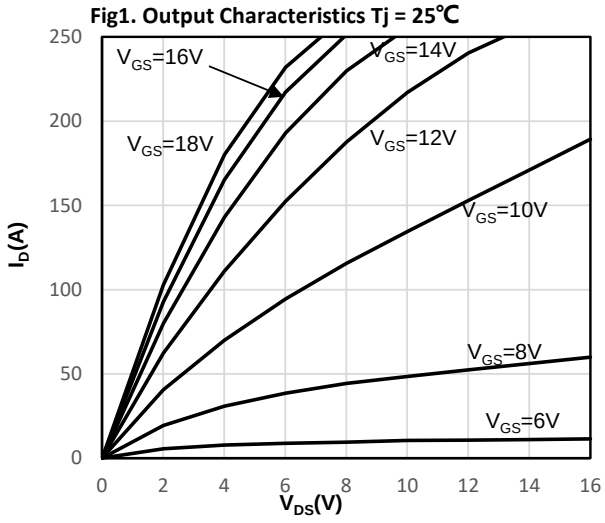


Fig2. Output Characteristics Tj = -55℃

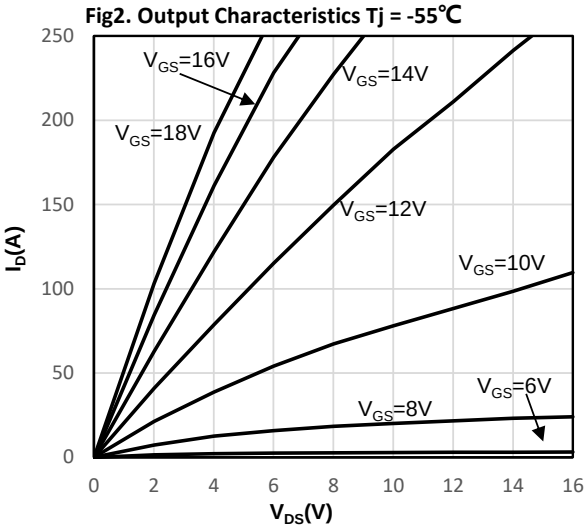


Fig3. Output Characteristics Tj = 175℃

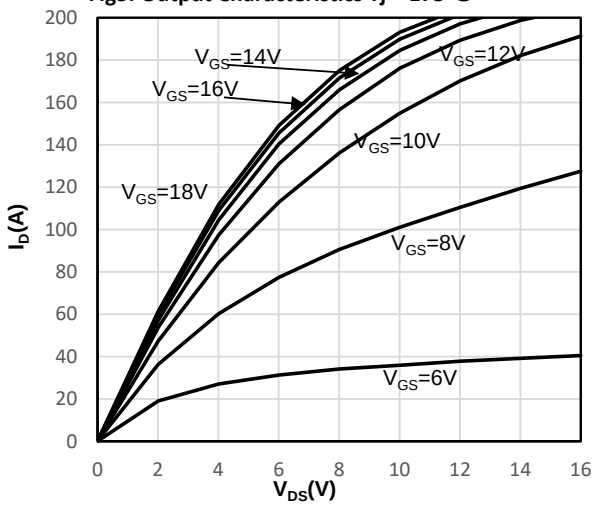


Fig4. Transfer Characteristics

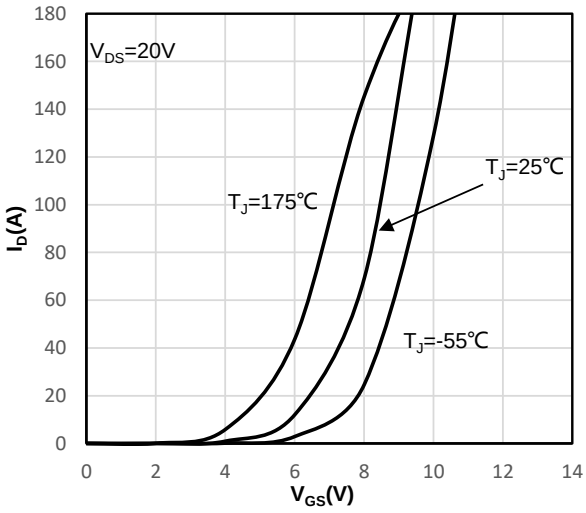


Fig5. Rds(on) vs. Temperature

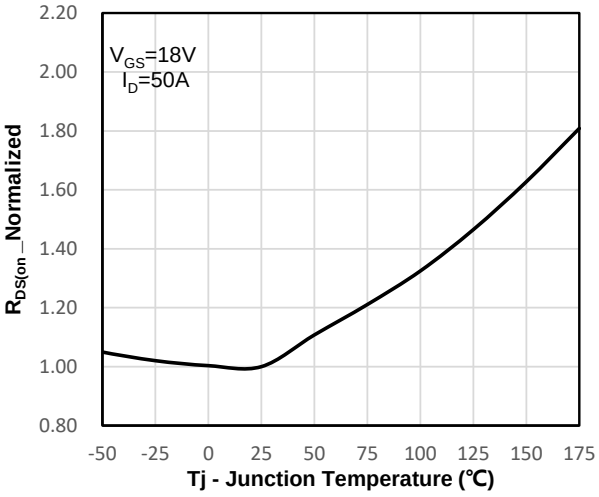
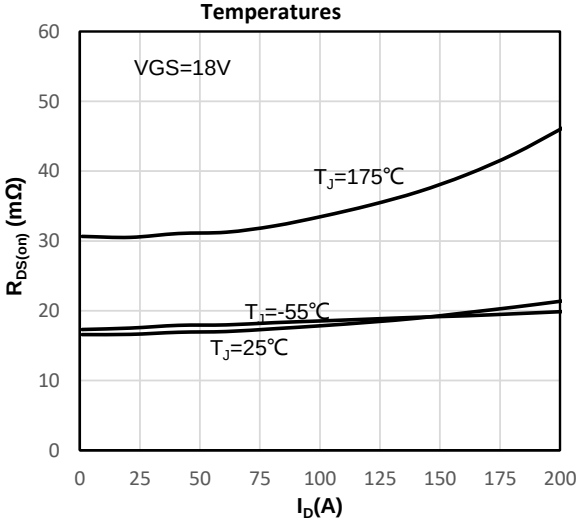


Fig6. Rds(on) vs Drain Current for Various Temperatures



Typical Characteristics Diagram

Fig7. Rds(on) vs Temperature for Various Gate Voltage

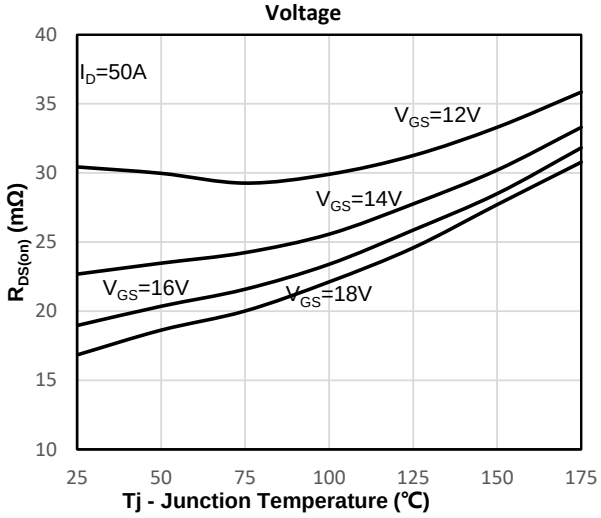


Fig8. Capacitance Characteristics

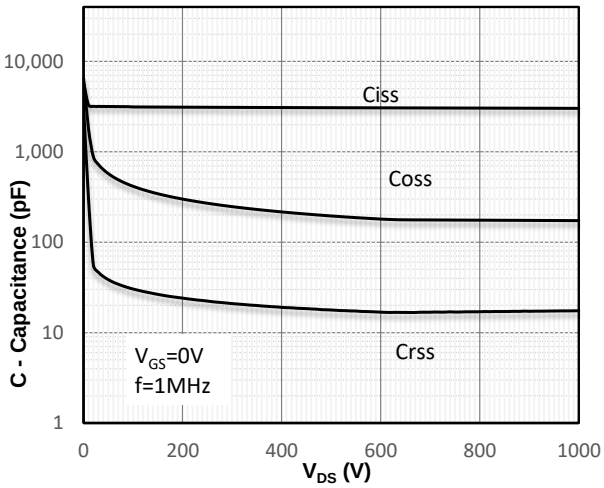


Fig9. Gate Charge Characteristics

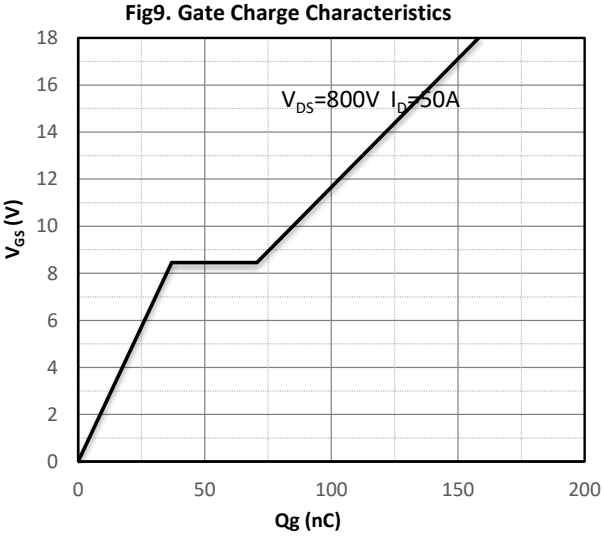


Fig10.Threshold Voltage- Junction Temperature Curve

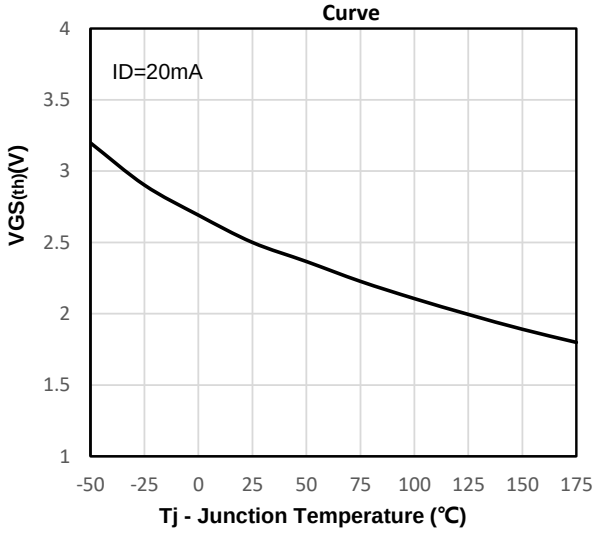


Fig11. Body Diode Characteristic at 25℃

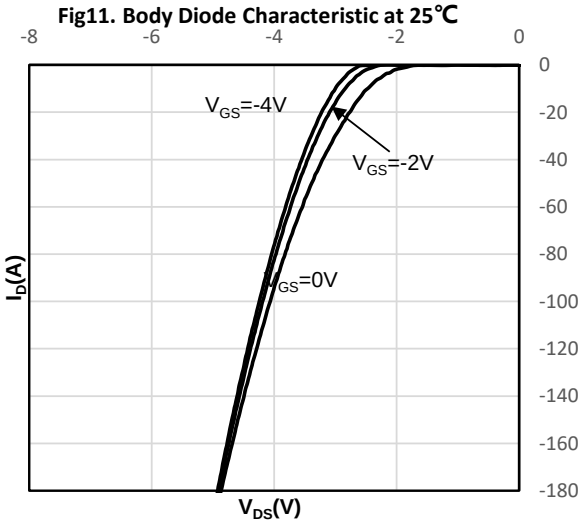
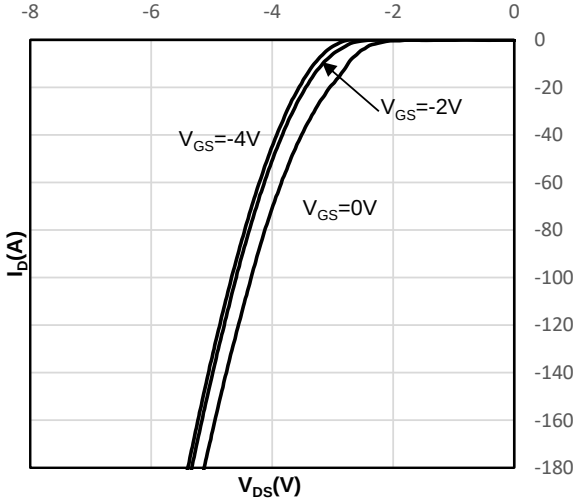


Fig12. Body Diode Characteristic at -55℃



Typical Characteristics Diagram

Fig13.Body Diode Characteristic at 175℃

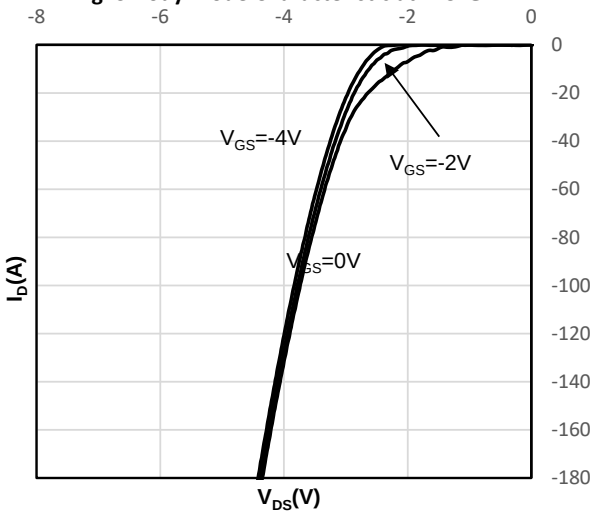


Fig14.3rd Quadrant Characteristic at 25℃

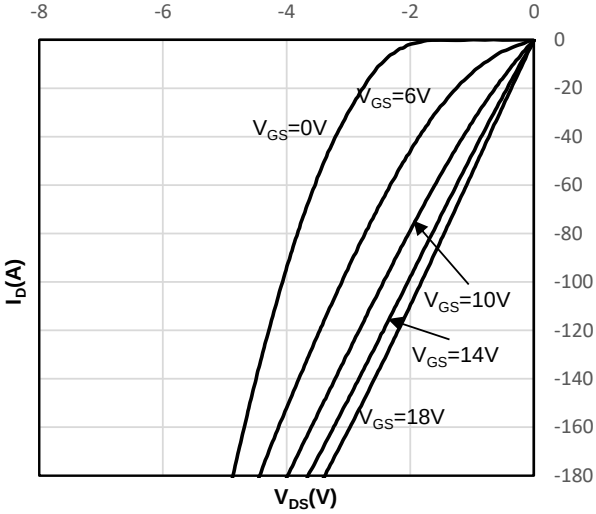


Fig15.3rd Quadrant Characteristic at -55℃

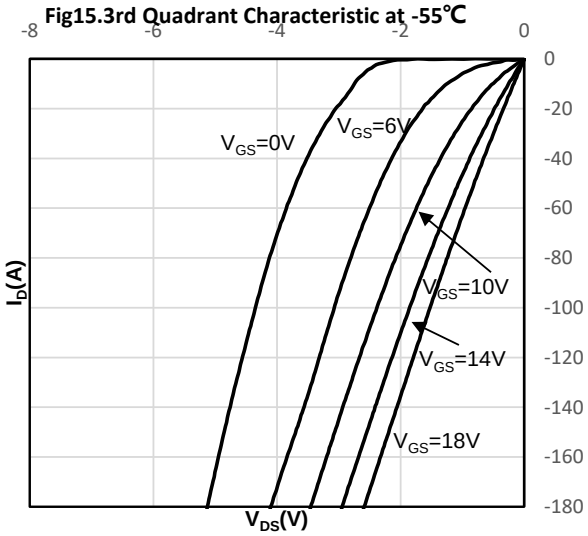


Fig16.3rd Quadrant Characteristic at 175℃

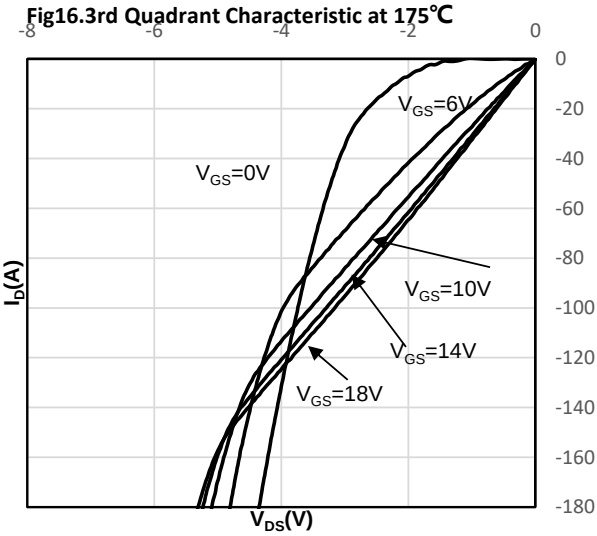


Fig17. Power De-rating

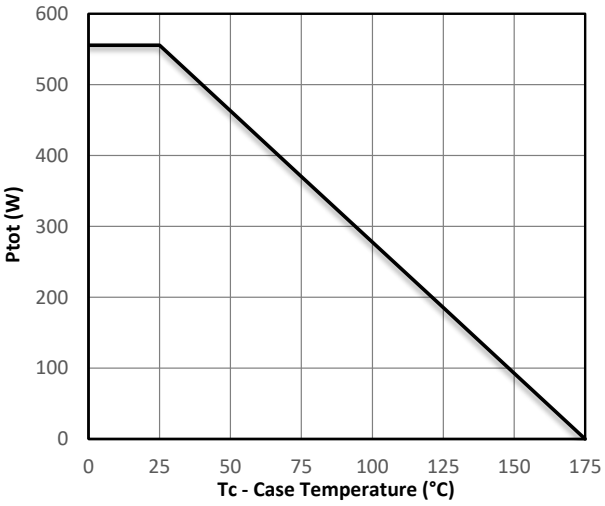
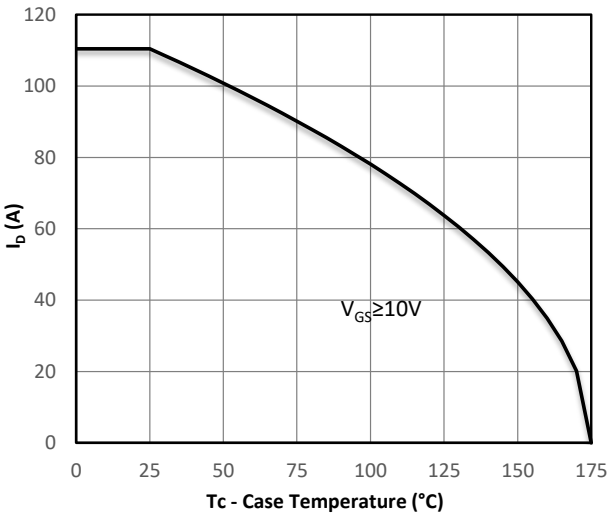


Fig18.Current De-rating



Typical Characteristics Diagram

Fig19. Max. Transient Thermal Impedance

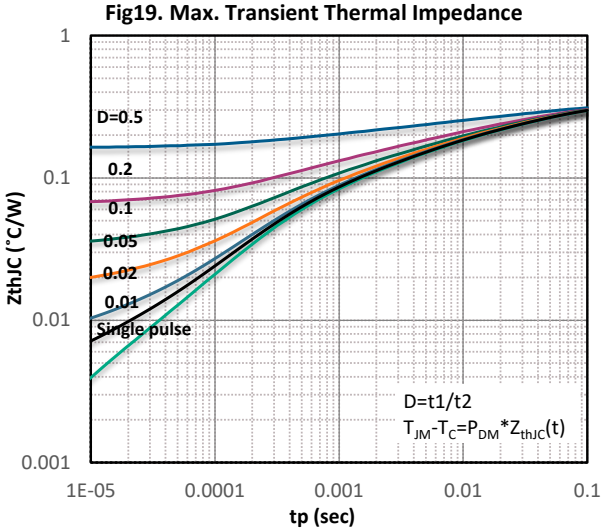
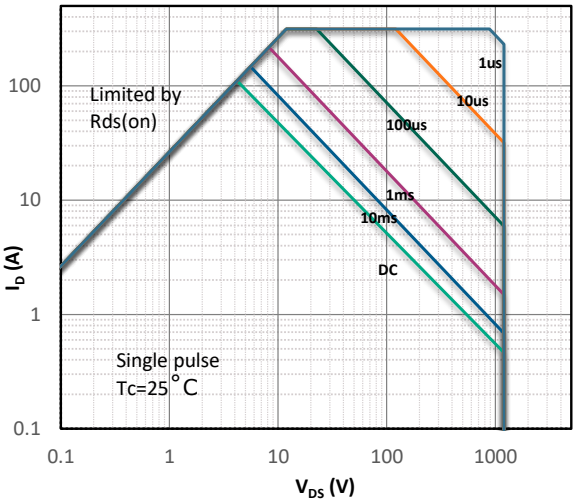
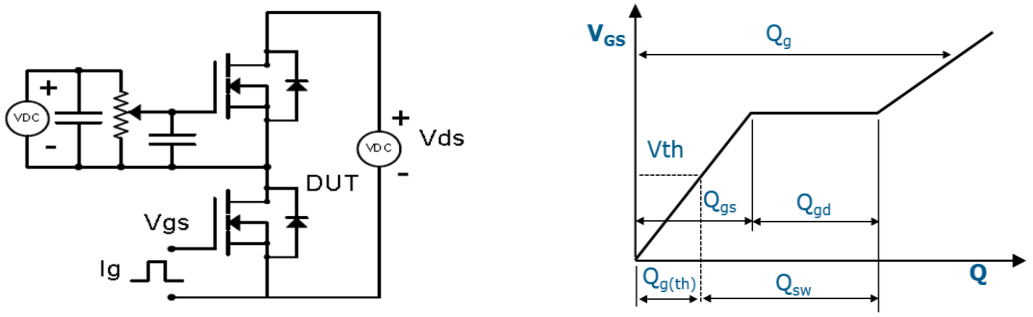


Fig20. Safe Operating Area

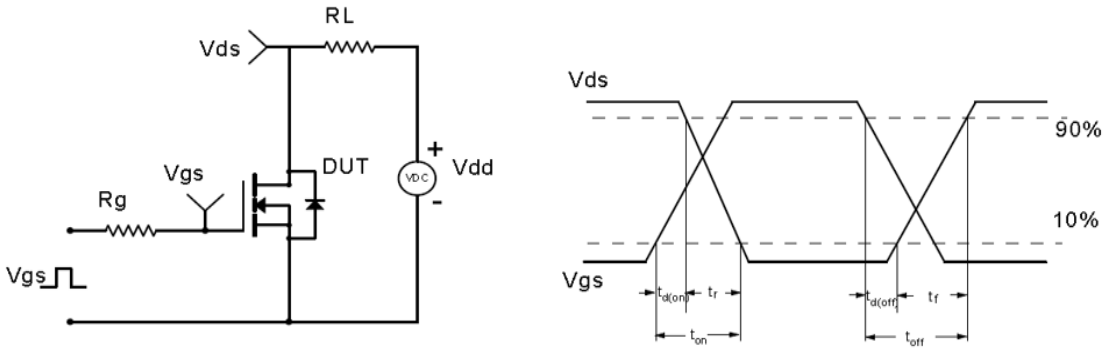


Test Circuit & Waveform

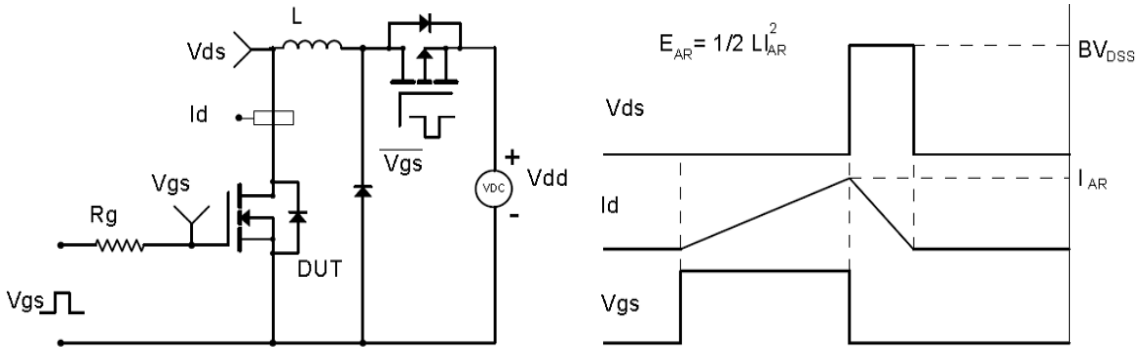
Gate Charge Test Circuit & Waveform



MOSFET Switching Test Circuit & Waveform

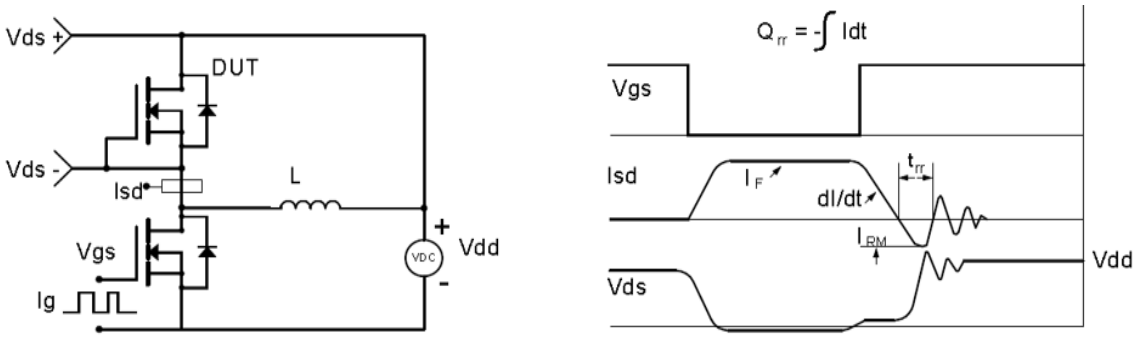


E_{AS} Test Circuit & Waveform



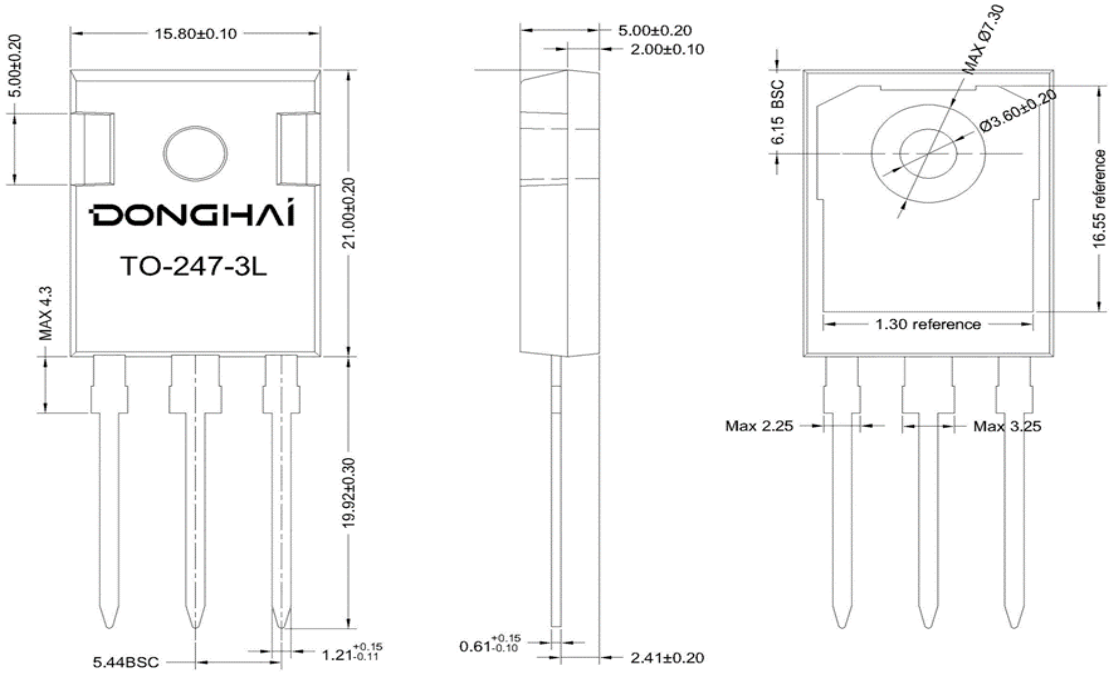
Test Circuit & Waveform

Diode Recovery Test Circuit & Waveform



Package Outline : TO-247-3L

*Dimensions in mm



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