

Features

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

Key Parameters

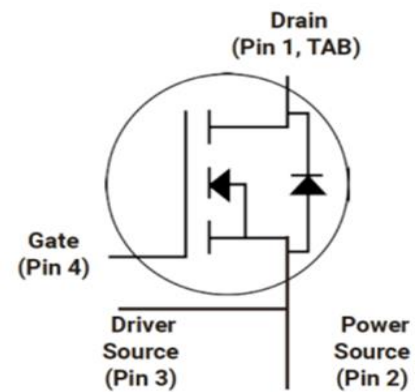
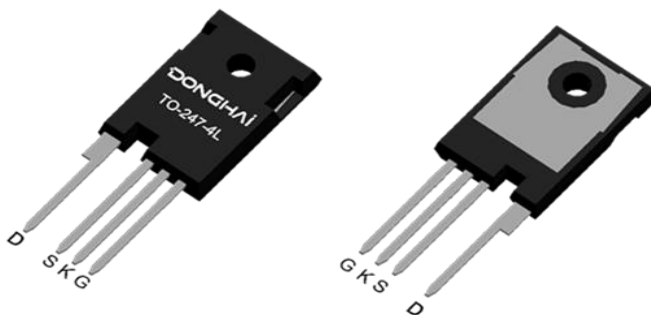
V_{DS}	1200V
$R_{DS(on)typ}$	16mΩ
I_D	110A
V_{th}	2.5V

Applications

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



TO-247-4



Marking & Packing Information

Part #	Package	Marking	Tube/Reel	Qty(pcs)
DCCF016M120G3	TO-247-4	DCCF016M120G3	Tube	240/box

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage (V _{GS} =0V, I _D =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 (V _{GS} =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 T_j = 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	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	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	21	mΩ	V _{GS} =18V, I _D =50A T _j =25°C T _j =175°C
Transconductance	g _{fs}	-	16.3	-	S	V _{DS} =20V, I _D =50A T _j =25°C T _j =175°C

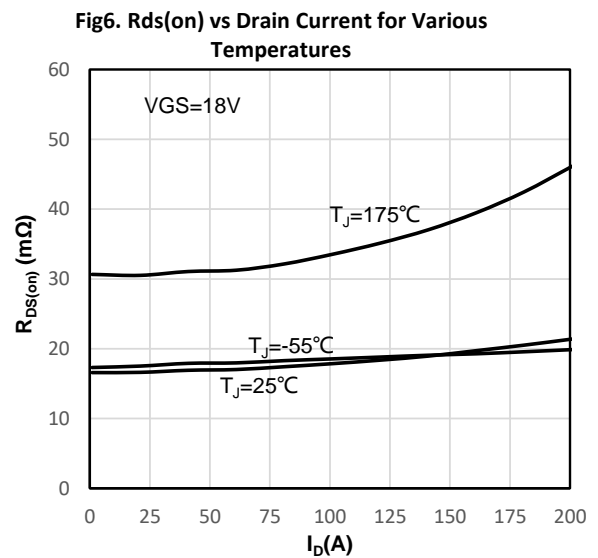
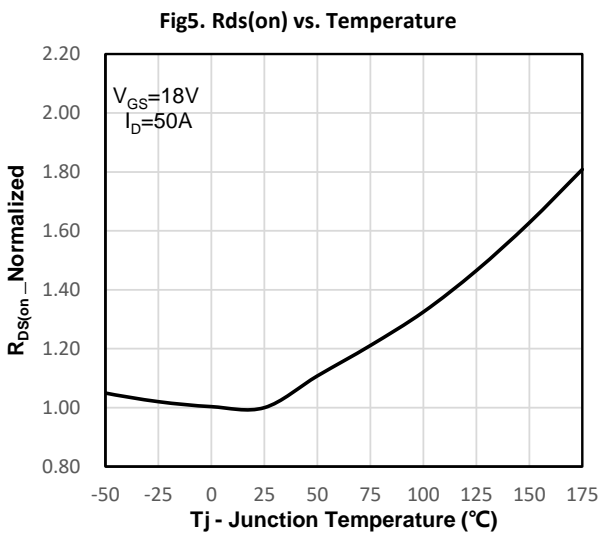
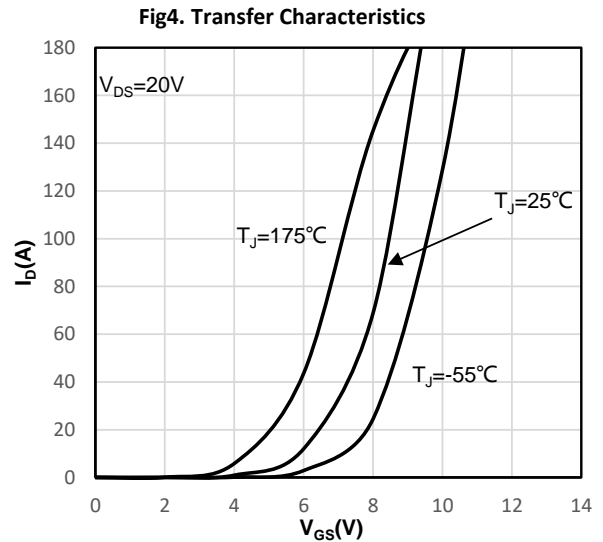
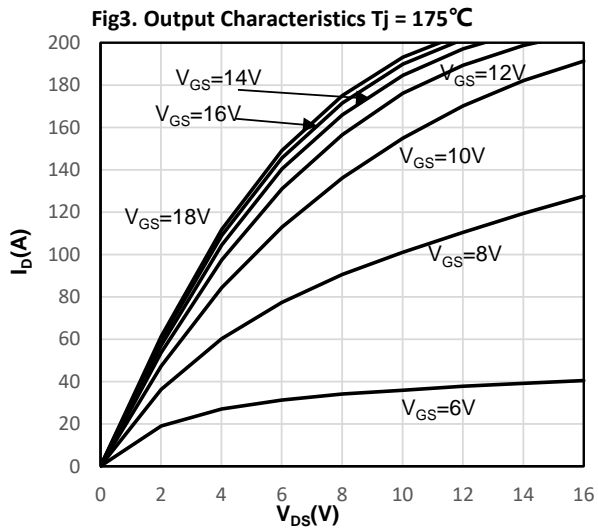
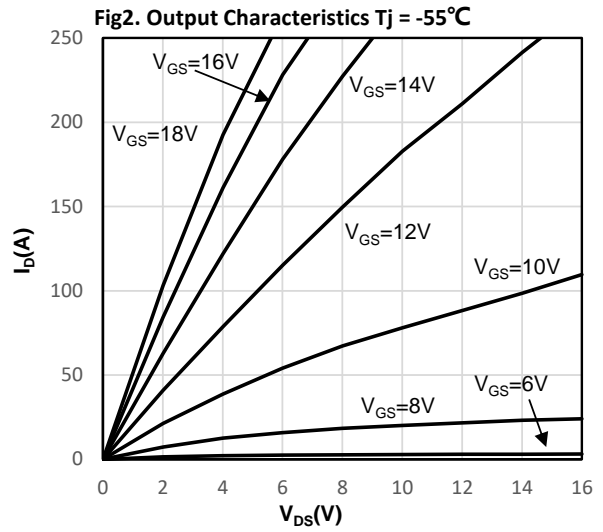
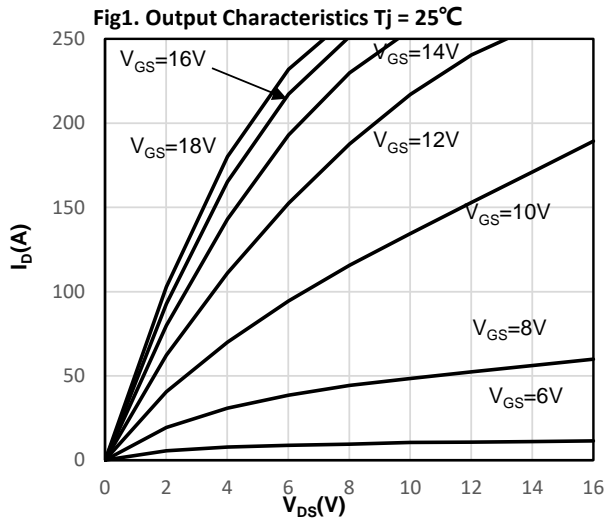
Dynamic Characteristic

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	-	154	-	nC	$V_{GS}=-4/18V,$ $V_{DS}=800V, I_D=50A,$ $f=1MHz$
Gate-Source charge	Q_{gs}	-	36	-		
Gate-Drain charge	Q_{gd}	-	32	-		
Turn-on delay time	$t_{d(on)}$	-	16	-	ns	$V_{DS}=800V,$ $V_{GS}=-4V/18V,$ $I_D=50A,$ $R_{G(ext)}=2.5\Omega,$ $L=100\mu H$
Rise time	t_r	-	22	-		
Turn-off delay time	$t_{d(off)}$	-	52	-		
Fall time	t_f	-	12	-		
Internal Gate Resistance	$R_{G(int)}$	-	3.4	-	Ω	$f=1MHz, V_{AC}=25mV$
Turn-On Switching Energy	E_{ON}	-	615	-	μJ	$V_{DS}=800V,$ $V_{GS}=-4V/18V,$ $I_D=50A,$ $R_{G(ext)}=2.5\Omega,$ $L=100\mu H$
Turn-Off Switching Energy	E_{OFF}	-	168	-		

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	$V_{GS}=-4V, I_{SD}=25A$ $T_j=25^\circ C$
		-	3.0	-		$T_j=175^\circ C$
Diode Reverse Recovery Time	t_{rr}	-	18.9	-	ns	$V_R=800V, I_{SD}=50A,$ $dI/dt=1000A/\mu s$
Diode Reverse Recovery Charge	Q_{rr}	-	240	-	nC	
Peak Reverse Recovery Current	I_{rrm}	-	20	-	A	

Typical Characteristics Diagram



Typical Characteristics Diagram

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

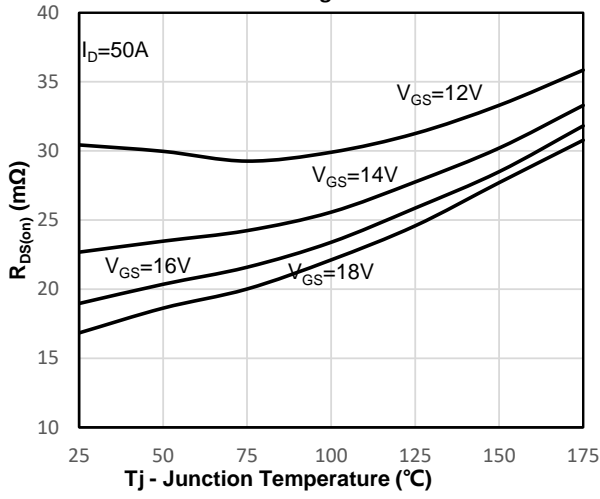


Fig8. Capacitance Characteristics

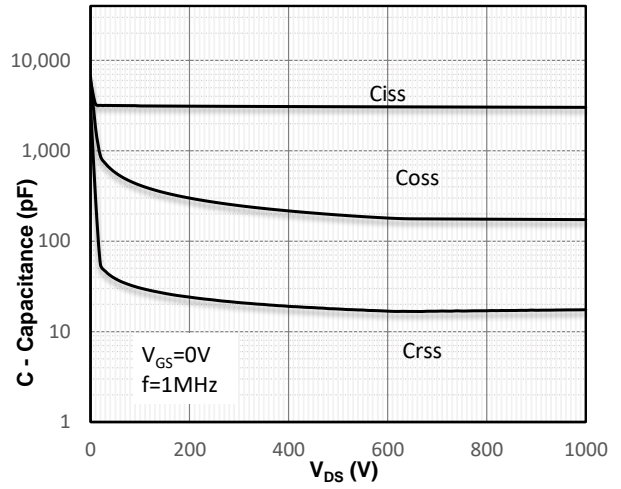


Fig9. Gate Charge Characteristics

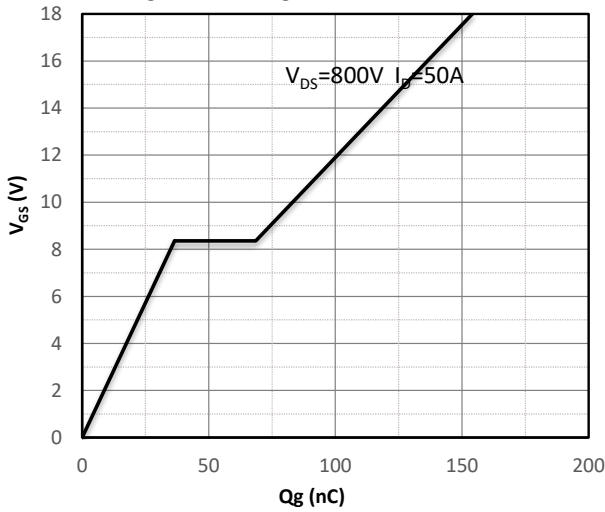


Fig10. Threshold Voltage- Junction Temperature Curve

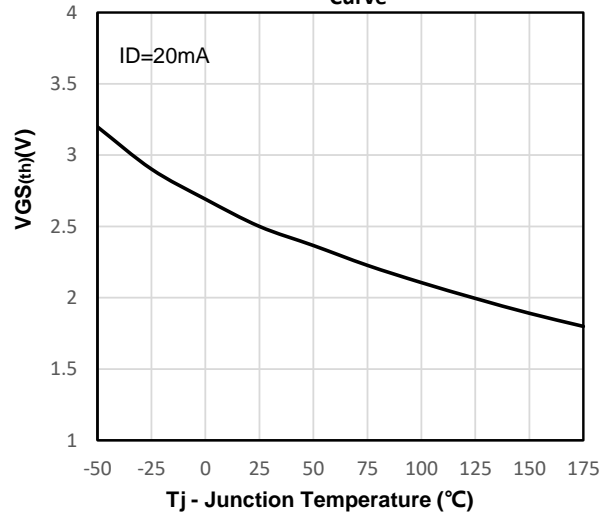


Fig11. Body Diode Characteristic at 25°C

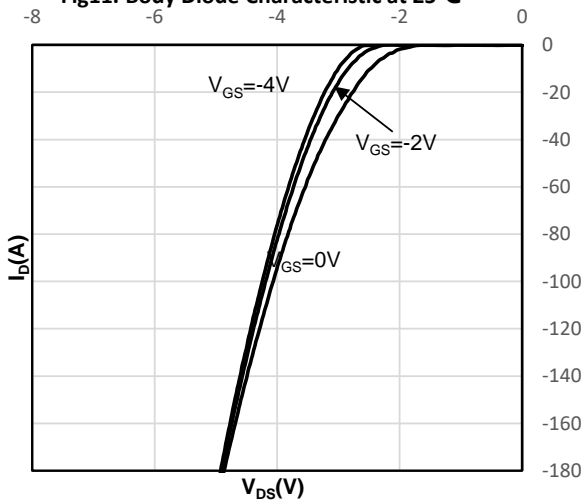
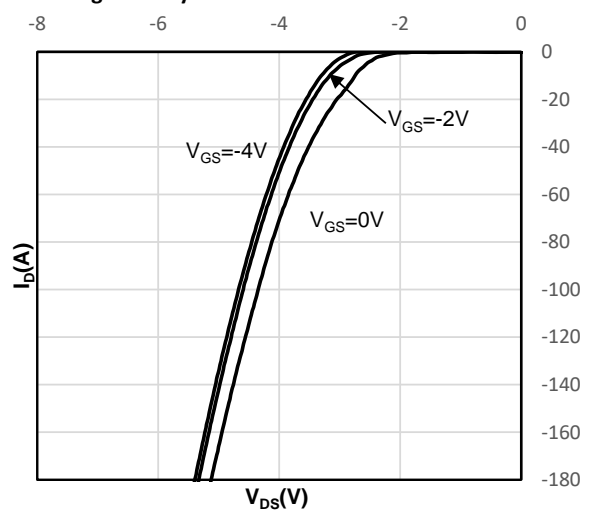
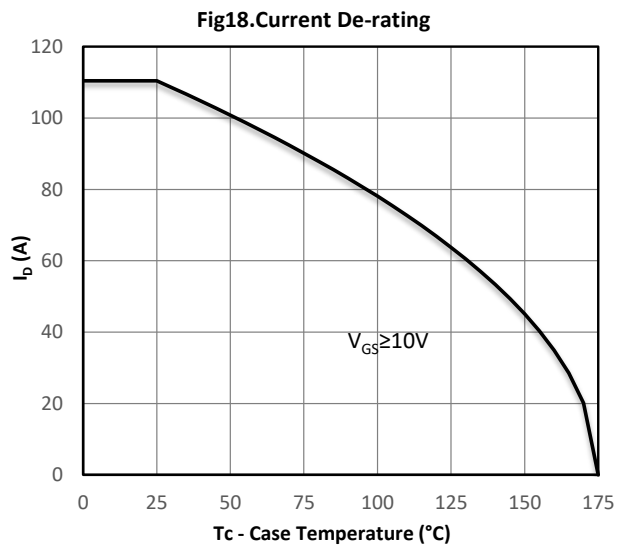
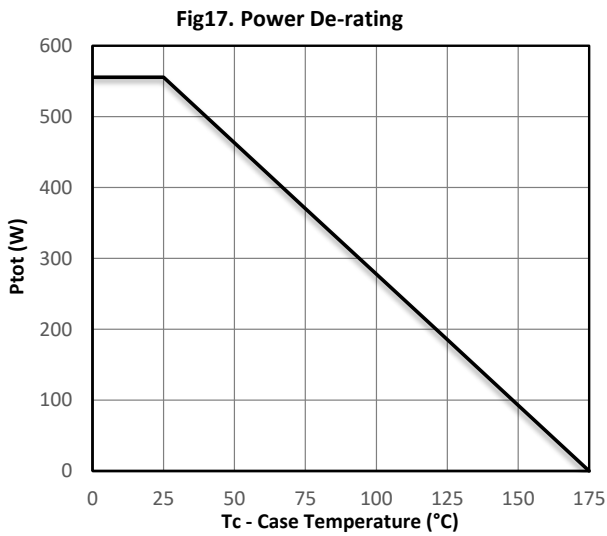
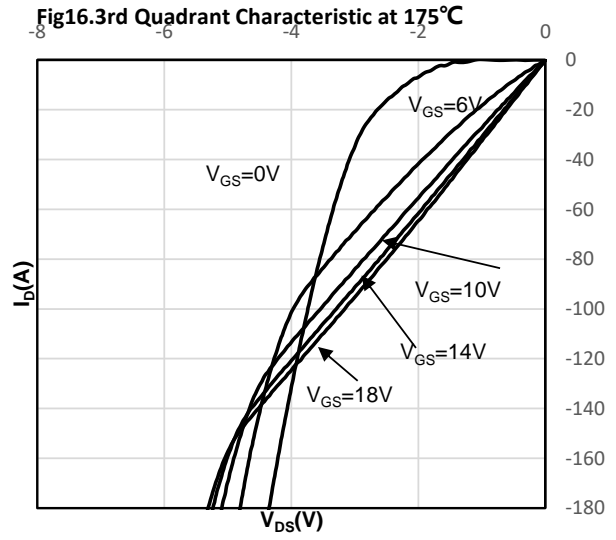
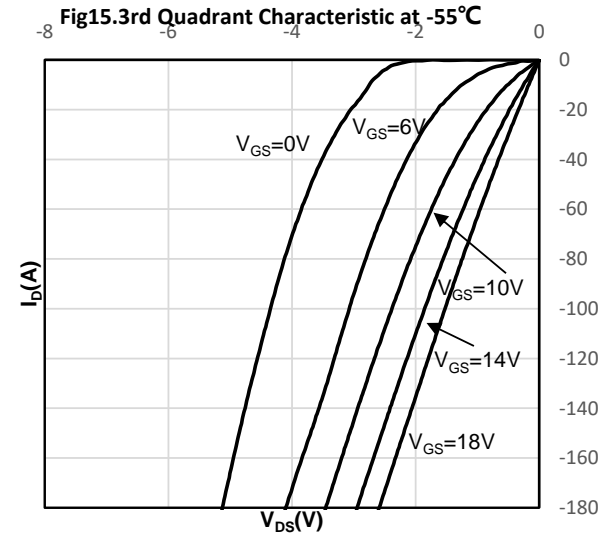
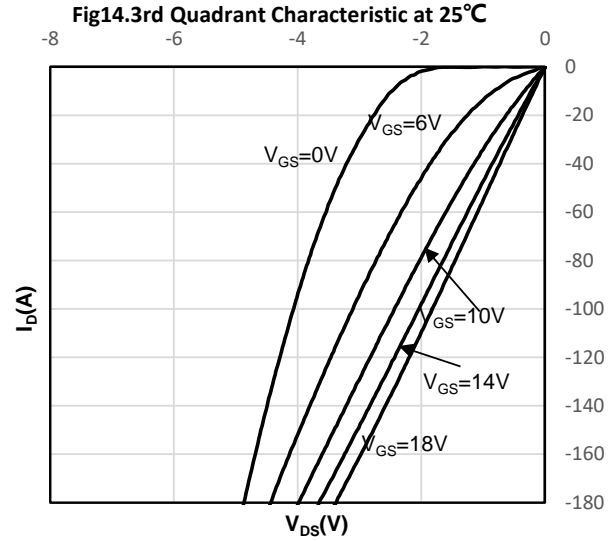
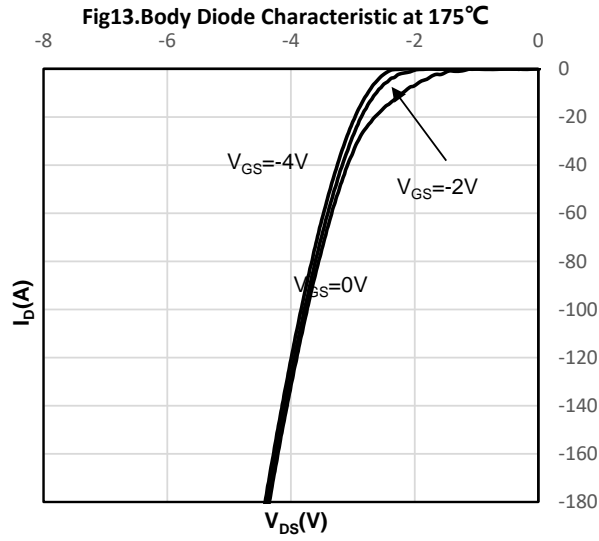


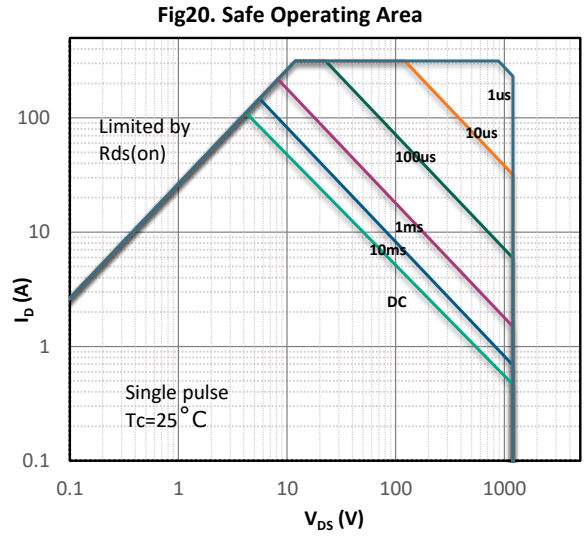
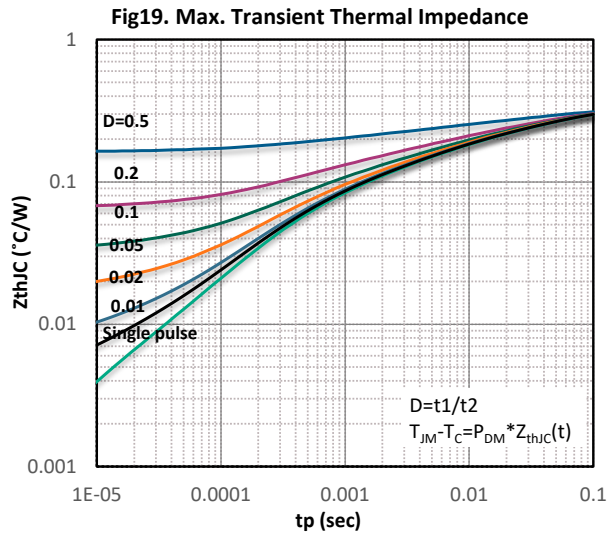
Fig12. Body Diode Characteristic at -55°C



Typical Characteristics Diagram

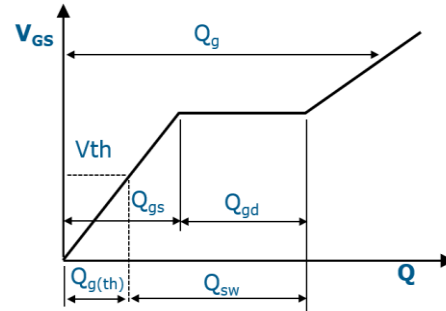
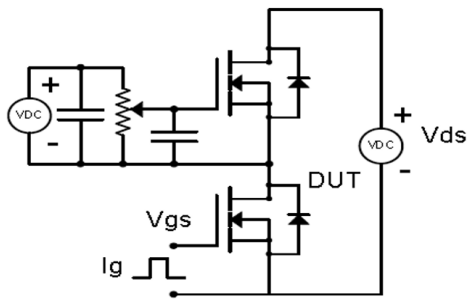


Typical Characteristics Diagram

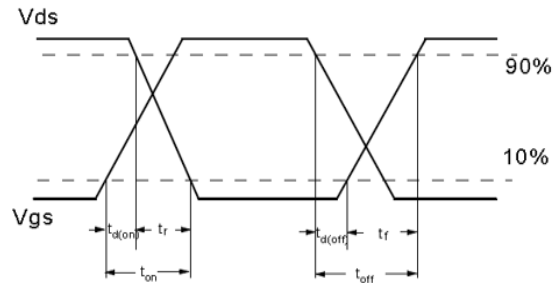
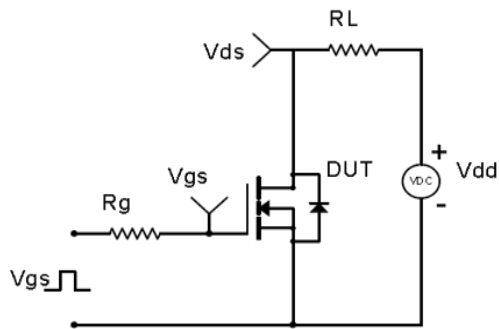


Test Circuit & Waveform

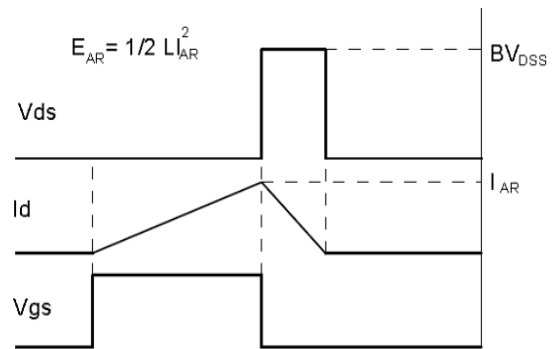
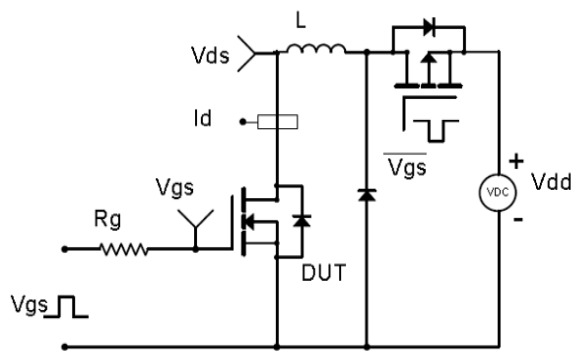
Gate Charge Test Circuit & Waveform



MOSFET Switching Test Circuit & Waveform

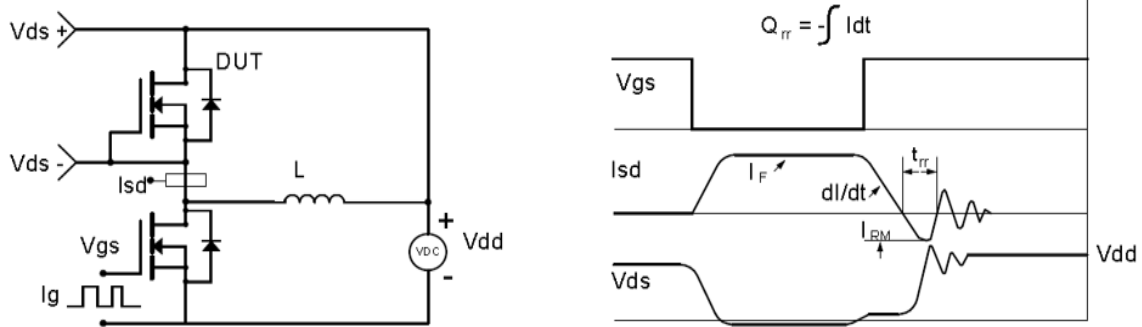


EAS Test Circuit & Waveform



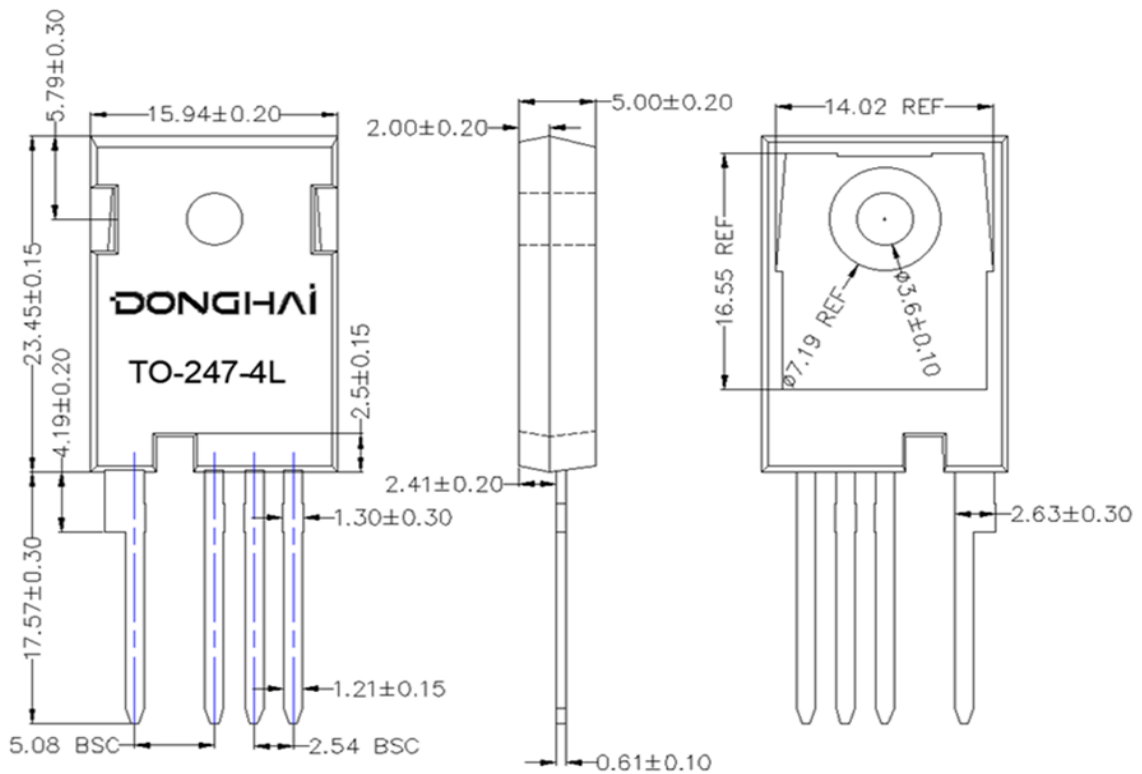
Test Circuit & Waveform

Diode Recovery Test Circuit & Waveform



Package Outline : TO-247-4L

*Dimensions in mm



Disclaimer

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