

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive
- 15V / 0V V_{GS} compatible with most flyback controllers

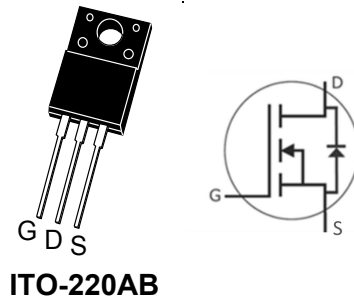
Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency
- Reduction of heat sink requirements

Applications

- Solar and UPS inverters
- On Board Charger
- High voltage DC/DC converters
- Switched mode power supplies
- Load switch
- LED/LCD/PDP TV and monitor Lighting

Parameter		Value	Unit
V_{DS}		650	V
$R_{DS(on)}$ typ.	$V_{GS}=18V$	160	m Ω
I_D		17	A



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

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	650	V	$V_{GS}=0V$, $I_D=500\mu A$	
V_{GSmax}	Gate-Source Voltage	-8/+20	V	Absolute maximum values	
V_{GSop}	Gate-Source Voltage	-5...0/+15	V	Recommended operational values	
I_D	Continuous Drain Current	17	A	$V_{GS}=15V$, $T_c=25^\circ\text{C}$	Fig. 19
		12		$V_{GS}=15V$, $T_c=100^\circ\text{C}$	
$I_{D(pulse)}$	Pulsed Drain Current	43	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	37	W	$T_c=25^\circ\text{C}$, $T_J=175^\circ\text{C}$	Fig. 20
T_J , T_{STG}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		
T_L	Solder Temperature, 1.6mm from case for 10s	260	$^\circ\text{C}$		



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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	650	/	/	V	$V_{GS}=0V, I_D=500\mu A$	
$V_{GS(th)}$	Gate Threshold Voltage	2.4	3.2	4.0	V	$V_{DS}=V_{GS}, I_D=2mA$	Fig. 11
		/	2.4	/		$V_{DS}=V_{GS}, I_D=2mA, T_J=175^{\circ}\text{C}$	
I_{DSS}	Zero Gate Voltage Drain Current	/	/	10	μA	$V_{DS}=650V, V_{GS}=0V$	
I_{GSS+}	Gate-Source Leakage Current	/	/	50	nA	$V_{DS}=0V, V_{GS}=20V$	
I_{GSS-}	Gate-Source Leakage Current	/	/	50	nA	$V_{DS}=0V, V_{GS}=-8V$	
$R_{DS(on)}$	Drain-Source On-State Resistance	/	190	268	m Ω	$V_{GS}=15V, I_D=7A$	Fig. 4,5,6
		/	230	/	m Ω	$V_{GS}=15V, I_D=7A, T_J=175^{\circ}\text{C}$	
		/	160	220	m Ω	$V_{GS}=18V, I_D=7A$	
		/	200	/	m Ω	$V_{GS}=18V, I_D=7A, T_J=175^{\circ}\text{C}$	
g_{fs}	Transconductance	/	6.2	/	S	$V_{DS}=20V, I_{DS}=7A$	Fig. 7
		/	5.6	/		$V_{DS}=20V, I_{DS}=7A, T_J=175^{\circ}\text{C}$	
C_{iss}	Input Capacitance	/	448	/	pF	$V_{GS}=0V$	Fig. 17,18
C_{oss}	Output Capacitance	/	44	/		$V_{DS}=400V$	
C_{rss}	Reverse Transfer Capacitance	/	2.2	/		$f=1MHz$	
E_{oss}	C_{oss} Stored Energy	/	2.8	/	μJ	$V_{AC}=25mV$	Fig. 16
E_{ON}	Turn-On Switching Energy	/	24	/	μJ	$V_{DS}=400V, V_{GS}=0V/15V$	
E_{OFF}	Turn-Off Switching Energy	/	16	/		$I_D=7A, R_{G(ext)}=2.5\Omega, L=100\mu H$	
$t_{d(on)}$	Turn-On Delay Time	/	11	/	ns	$V_{DS}=400V, V_{GS}=0V/15V, I_D=7A$ $R_{G(ext)}=2.5\Omega, R_L=80\Omega$	
t_r	Rise Time	/	8.6	/			
$t_{d(off)}$	Turn-Off Delay Time	/	18.2	/			
t_f	Fall Time	/	14.6	/			
$R_{G(int)}$	Internal Gate Resistance	/	7	/	Ω	$f=1MHz, V_{AC}=25mV$	
Q_{GS}	Gate to Source Charge	/	4.6	/	nC	$V_{DS}=400V$	Fig. 12
Q_{GD}	Gate to Drain Charge	/	3.8	/		$V_{GS}=0V/15V$	
Q_G	Total Gate Charge	/	12.6	/		$I_D=7A$	

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.7	/	V	$V_{GS}=-5V, I_{SD}=3.5A, T_J=25^{\circ}\text{C}$	Fig. 8,9,10
		3.6	/		$V_{GS}=-5V, I_{SD}=3.5A, T_J=175^{\circ}\text{C}$	
I_S	Continuous Diode Forward Current	/	16	A	$T_C=25^{\circ}\text{C}$	
t_{rr}	Reverse Recover Time	12	/	ns	$V_R=400V, I_{SD}=3.5A$	
Q_{rr}	Reverse Recovery Charge	28	/	nC		
I_{rrm}	Peak Reverse Recovery Current	1.8	/	A		



Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
R _{θJC}	Thermal Resistance from Junction to Case	4	/	°C/W		
R _{θJA}	Thermal Resistance from Junction to Ambient	/	40			



Typical Performance

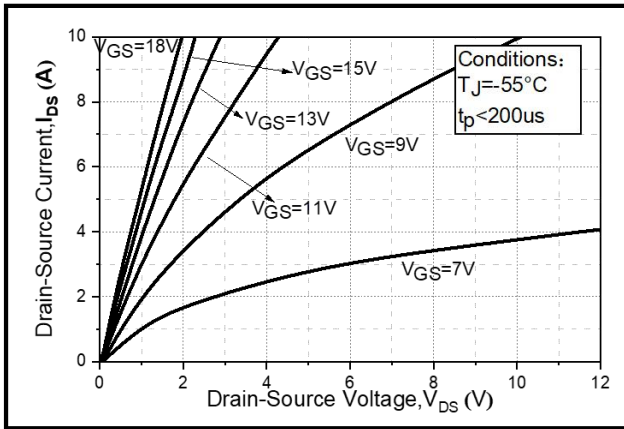


Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$

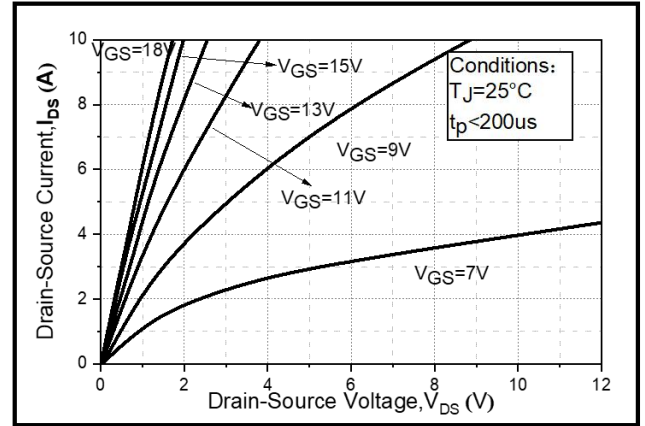


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

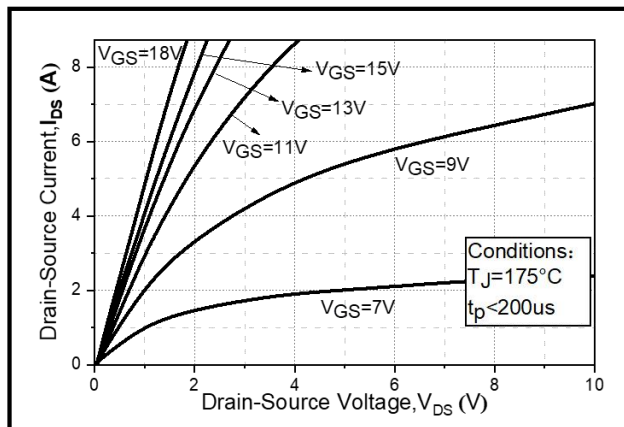


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

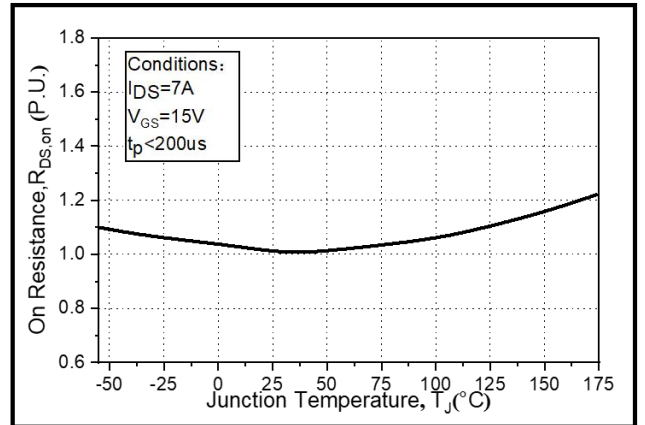


Figure 4. Normalized On-Resistance vs. Temperature

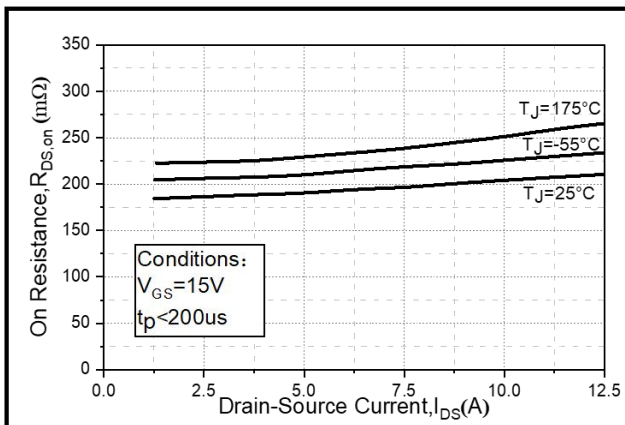


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

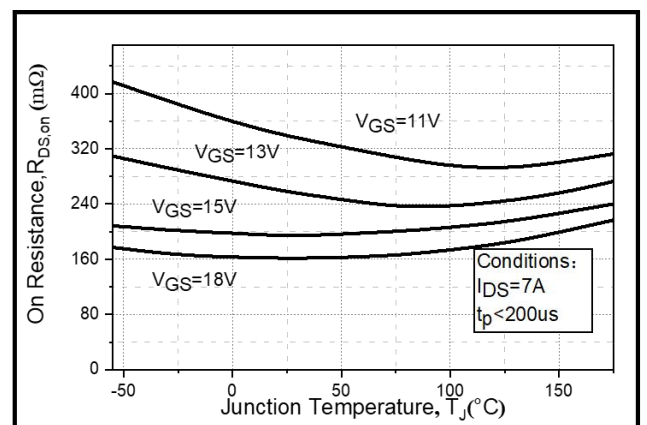


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage



Typical Performance

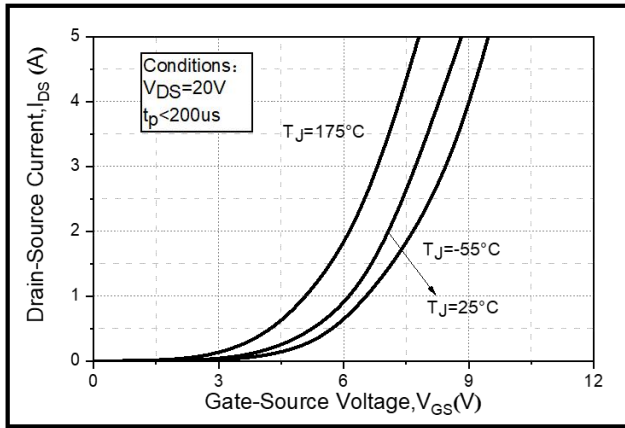


Figure 7. Transfer Characteristic for Various Junction Temperatures

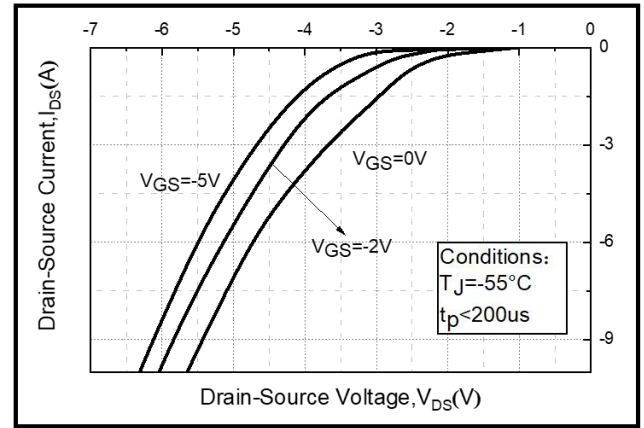


Figure 8. Body Diode Characteristic at -55°C

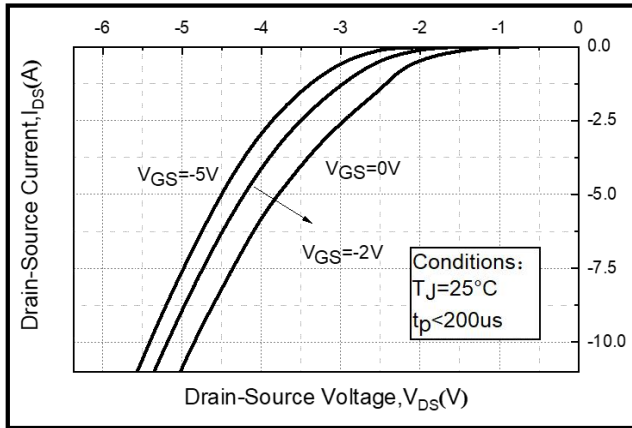


Figure 9. Body Diode Characteristic at 25°C

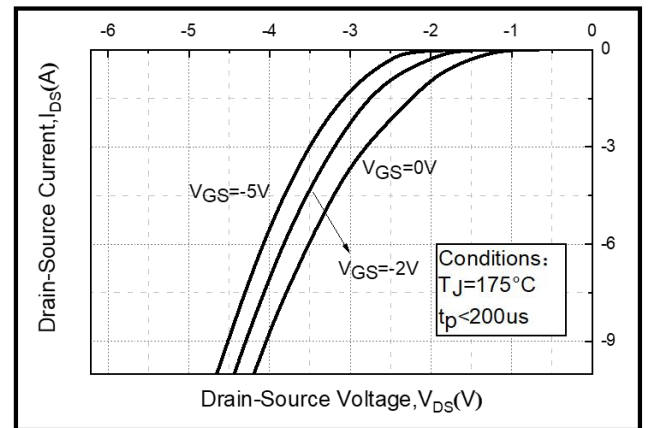


Figure 10. Body Diode Characteristic at 175°C

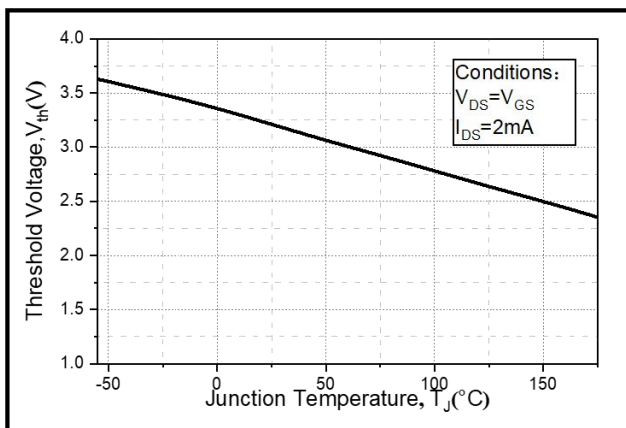


Figure 11. Threshold Voltage vs. Temperature

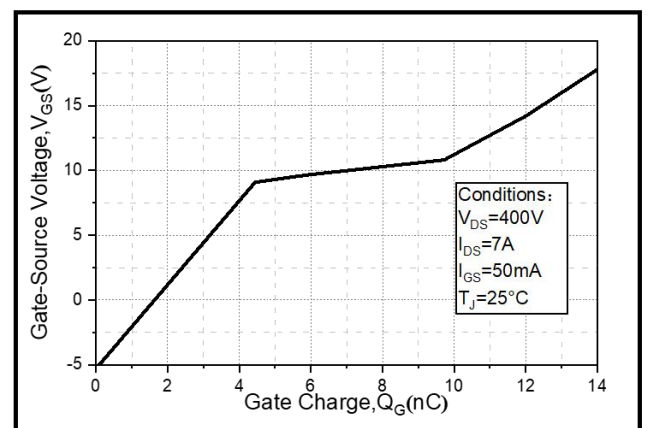


Figure 12. Gate Charge Characteristics



Typical Performance

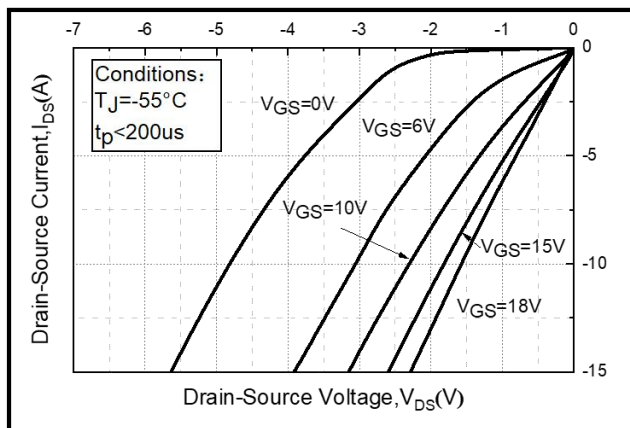


Figure 13. 3rd Quadrant Characteristic at -55°C

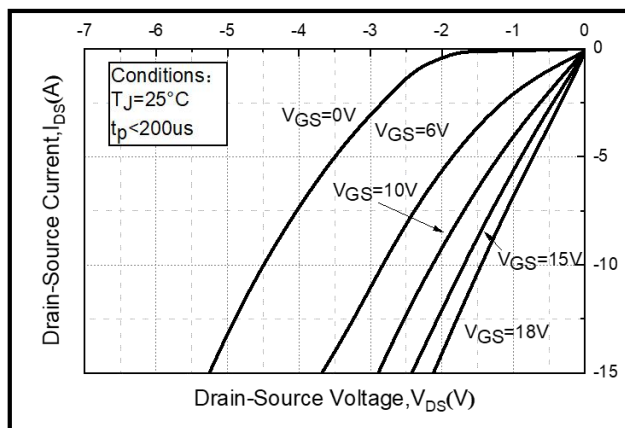


Figure 14. 3rd Quadrant Characteristic at 25°C

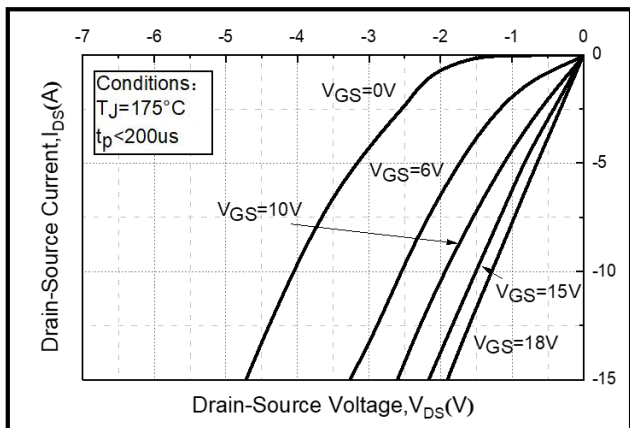


Figure 15. 3rd Quadrant Characteristic at 175°C

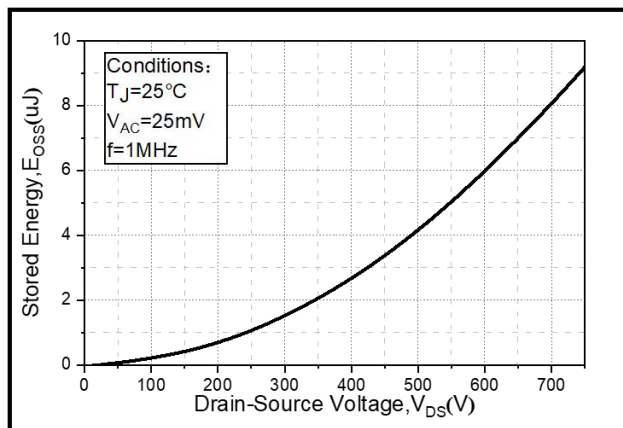
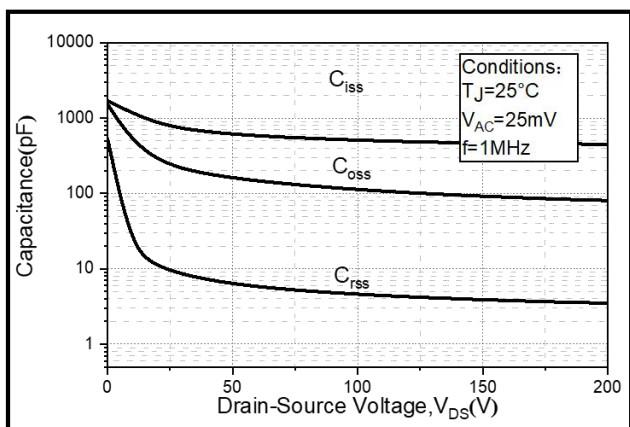
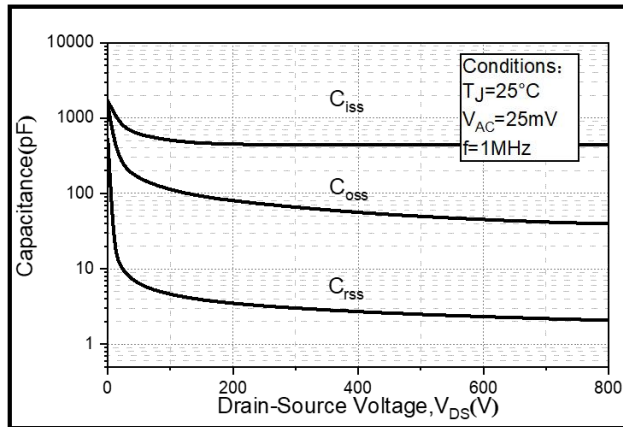


Figure 16. Output Capacitor Stored Energy



**Figure 17. Capacitances vs. Drain-Source Voltage
(0 - 200V)**



**Figure 18. Capacitances vs. Drain-Source Voltage
(0 - 800V)**



Typical Performance

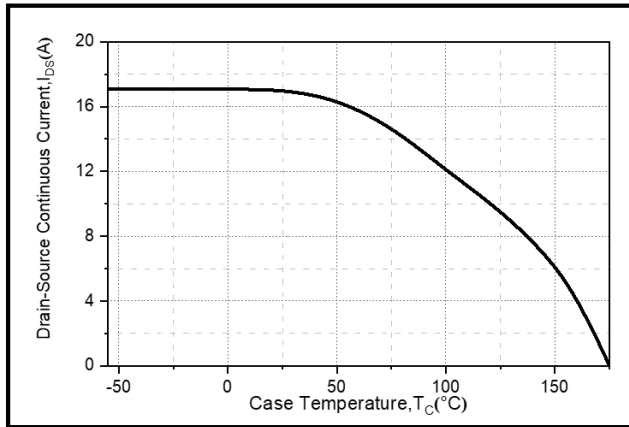


Figure 19. Continuous Drain Current vs. Case Temperature

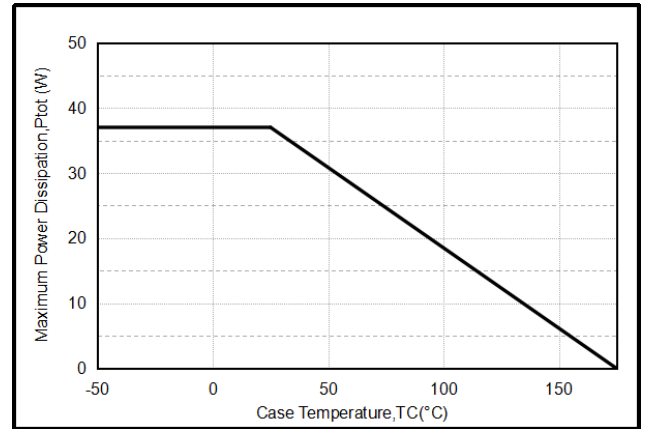


Figure 20. Maximum Power Dissipation vs. Case Temperature



Test Circuit Schematic

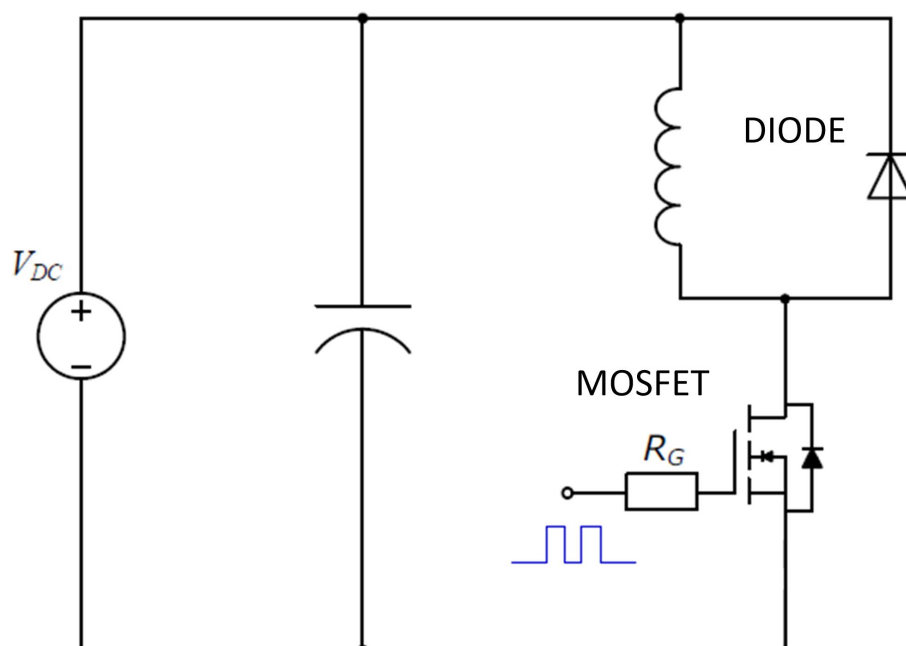
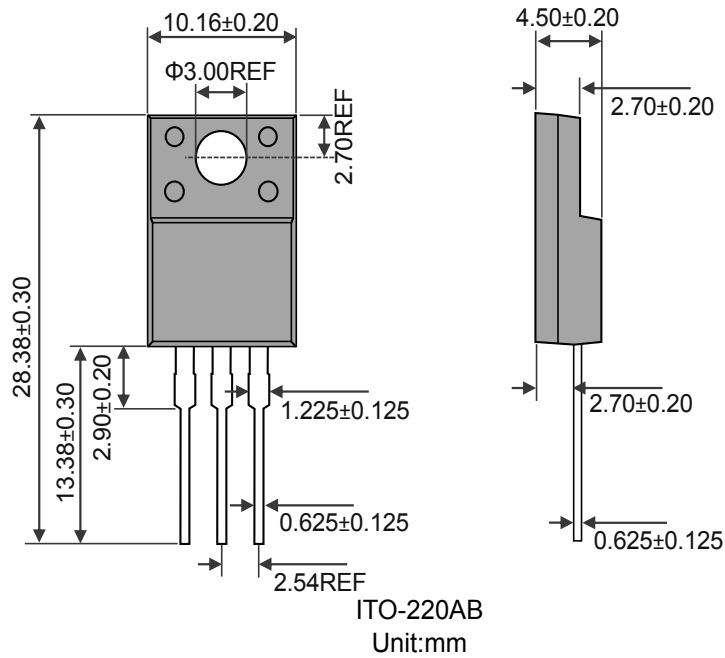


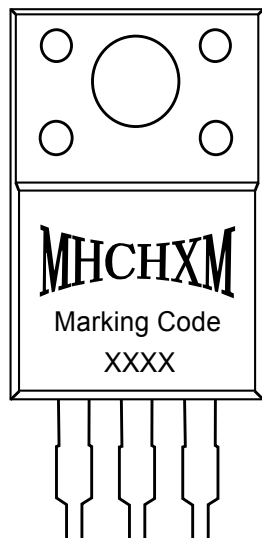
Figure 21. Clamped Inductive Switching
Waveform Test Circuit



Package Outline Dimensions



Marking Information



“MHCHXM”= Product Logo
 “Marking Code”= The Following
 “XXXX”= Date Code Marking

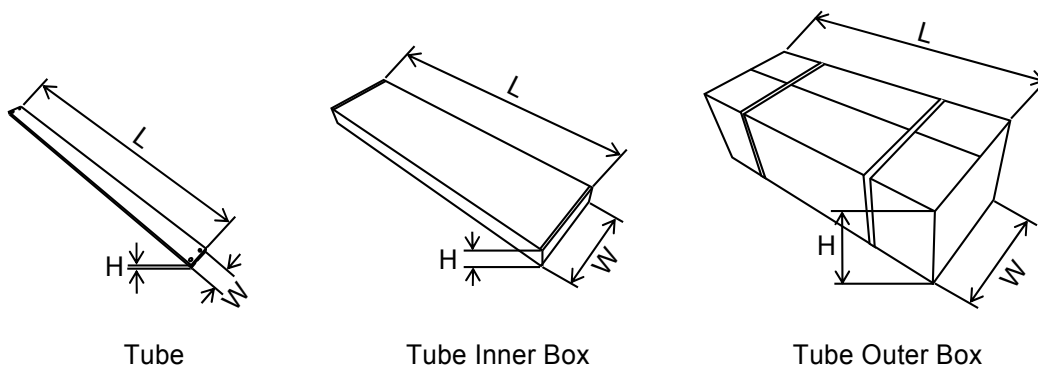
Marking Code	Part Number
C65N160F3	HXMC65N160F3



Packing Information

Packaging	Part Number	Quantity(pcs)	Size(mm)
Tube	Tube	50	L534×W33×H7
	Inner Box	1000	L560×W150×H40
	Outer Box	5000	L580×W235×H175

Packaging:Tube



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