

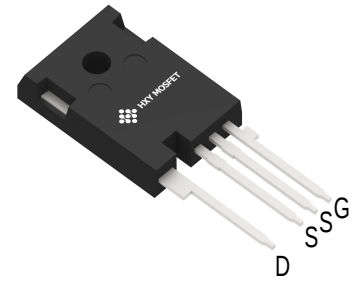


Features

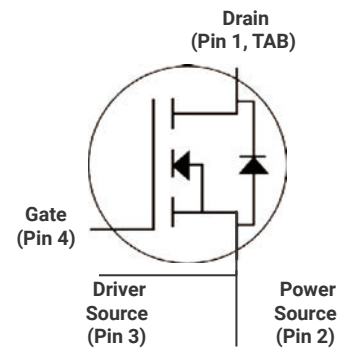
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive
- Resistant to Latch-Up
- Halogen Free, RoHS Compliant

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High voltage DC/DC converters
- EV Motor drive



TO-247H-4L



Ordering Part Number	Package	Qty(PCS)
IMZA120R014M1HXKSA1	TO-247H-4L	30



Maximum Ratings (T_c = 25 °C unless otherwise specified)

Parameter	Symbol	Condition	Value	Unit
Drain-Source Voltage	V _{DSmax}	V _{GS} =0V, I _D =100uA	1200	V
Gate-Source Voltage	V _{GSmax}	Absolute maximum values	-10/+22	V
Gate-Source Voltage	V _{GSop}	Recommended operational values	-5/+18	V
Continuous Drain Current	I _D	V _{GS} =18V, T _c =25°C	167	A
		V _{GS} =18V, T _c =100°C	118	
Pulsed Drain Current	I _{D(pulse)}	Pulse width t _p limited by T _{jmax}	TBD	A
Power Dissipation	P _D	T _c =25°C, T _j =175°C	555	W
Operating Junction Temperature	T _{vj, op}		-55~175	°C
Storage Temperature Range	T _{stg}		-55~175	°C



Electrical Characteristic (at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Condition		Value			Unit
				Min	Typ.	Max	
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =100μA		1200			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =20mA	T _{vj} =25°C		2.9		V
			T _{vj} =175°C		2.1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =1200V, V _{GS} =0V			1	100	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =18V, V _{DS} =0V			1	100	nA
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =18V, I _D =75A	T _{vj} =25°C		13		mΩ
			T _{vj} =175°C		20		
Transconductance	g _{fs}	V _{DS} =20V, I _{DS} =75A	T _{vj} =25°C		TBD		S
			T _{vj} =175°C		TBD		
Input Capacitance	C _{iss}	V _{GS} =0V V _{DS} =1200V f=100KHz V _{AC} =25mV			3815		pF
Output Capacitance	C _{oss}				239		
Reverse Transfer Capacitance	C _{rss}				29		
C _{oss} Stored Energy	E _{oss}				TBD		
Turn-On Switching Energy	E _{ON}	V _{DS} =800V, V _{GS} =-5/18V I _D =75A, R _{G(ext)} =2.5Ω, L=250μH	T _{vj} =25°C		TBD		μJ
Turn Off Switching Energy	E _{OFF}		T _{vj} =175°C		TBD		
			T _{vj} =25°C		TBD		
			T _{vj} =175°C		TBD		
Turn-On Delay Time	t _{d(on)}	V _{DS} =800V, V _{GS} =-5/18V I _D =75A, R _{G(ext)} =2.5Ω, T _J =25°C, L=250μH Timing relative to V _{DS}			TBD		ns
Rise Time	t _r				TBD		
Turn-Off Delay Time	t _{d(off)}				TBD		
Fall Time	t _f				TBD		
Internal Gate Resistance	R _{G(int)}	f=1MHz, V _{AC} =25mV			TBD		Ω
Gate to Source Charge	Q _{gs}	V _{DS} =800V, V _{GS} =-5/18V I _D =75A			46		nC
Gate to Drain Charge	Q _{gd}				100		
Total Gate Charge	Q _g				216		



Body Diode Characteristic

Parameter	Symbol	Condition	Value			Unit
			Min	Typ.	Max	
Diode Forward Voltage	V_{SD}	$V_{GS}=-5V, I_{SD}=37.5A$		4.7		V
				4.1		
Continuous Diode Forward Current	I_S	$V_{GS}=-5V, T_C=25^{\circ}C$			TBD	A
Diode Pulse Current	$I_{S(pulse)}$	$V_{GS}=-5V$, Pulse width t_p limited by T_{jmax}			TBD	A
Reverse Recovery Time	t_{rr}	$V_{GS}=-5V$ $I_{SD}=37.5A$ $R_{G(ext)}=2.5\Omega$ $T_J=175^{\circ}C$ $V_R=800V$		TBD		ns
Reverse Recovery Charge	Q_{rr}			TBD		nC
Peak Reverse Recovery Current	I_{rrm}			TBD		A

Thermal Characteristics

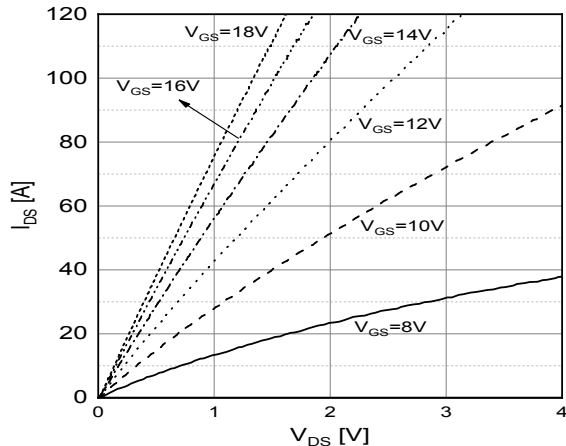
Parameter	Symbol	Condition	Value			Unit
			Min	Typ.	Max	
Thermal Resistance: Junction to Case	$R_{th(j-c)}$			0.27	0.37	$^{\circ}C/W$



Typical Performance

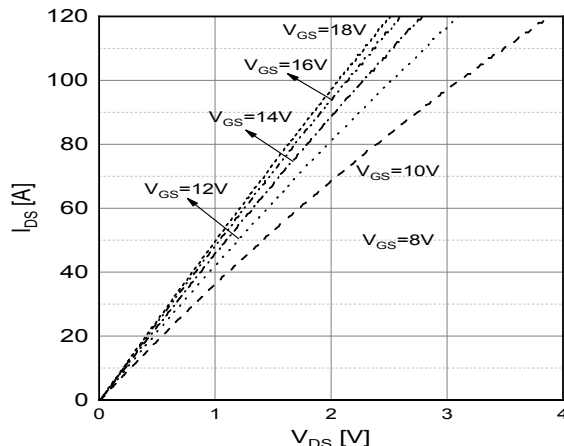
Output Characteristics

$I_{DS}=f(V_{DS}), T_J=25^{\circ}\text{C}$



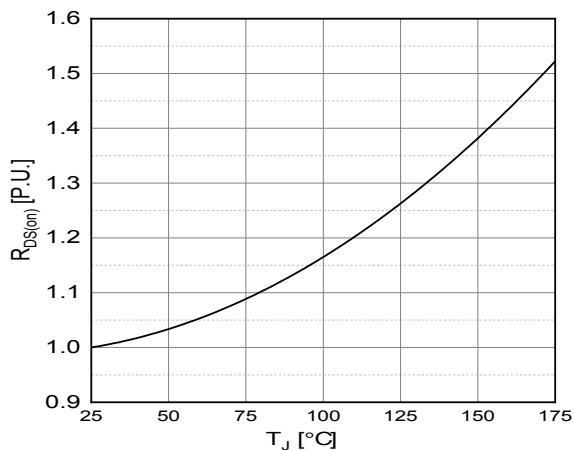
Output Characteristics

$I_{DS}=f(V_{DS}), T_J=175^{\circ}\text{C}$



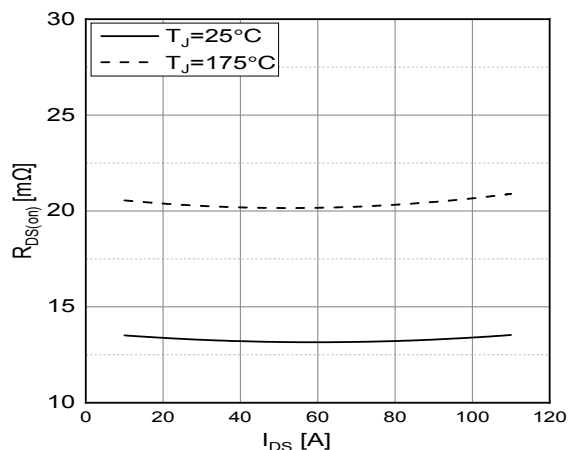
Normalized On-Resistance

$R_{DS(on)}=f(T_J), I_{DS}=75\text{A}, V_{GS}=18\text{V}$



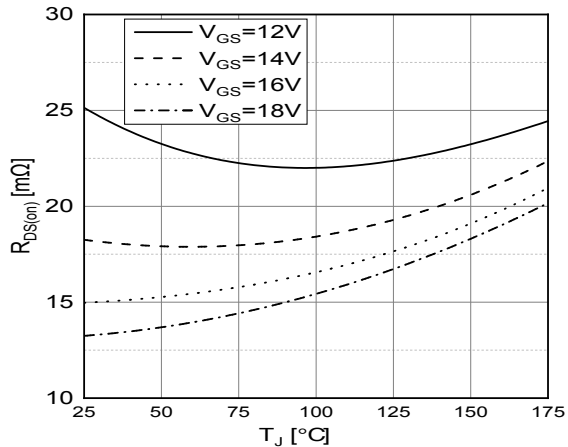
On-Resistance

$R_{DS(on)}=f(I_{DS}), V_{GS}=18\text{V}$



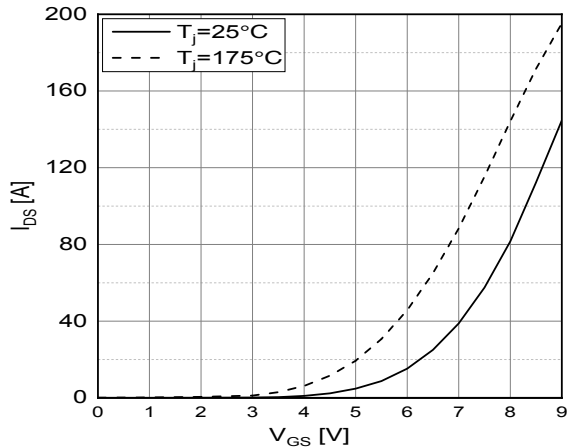
On-Resistance

$R_{DS(on)}=f(T_J), I_{DS}=75\text{A}$



Transfer Characteristics

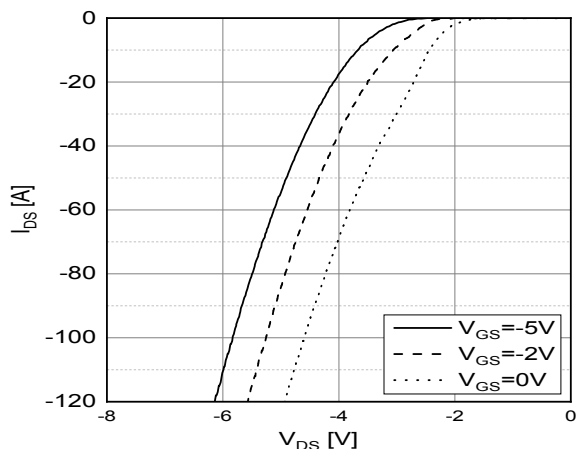
$I_{DS}=f(V_{GS}), V_{DS}=20\text{V}$





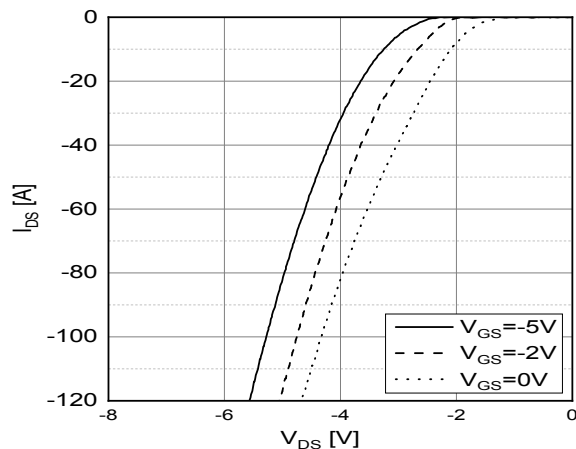
Body Diode Characteristics

$I_{DS}=f(V_{DS})$, $T_J=25^{\circ}\text{C}$



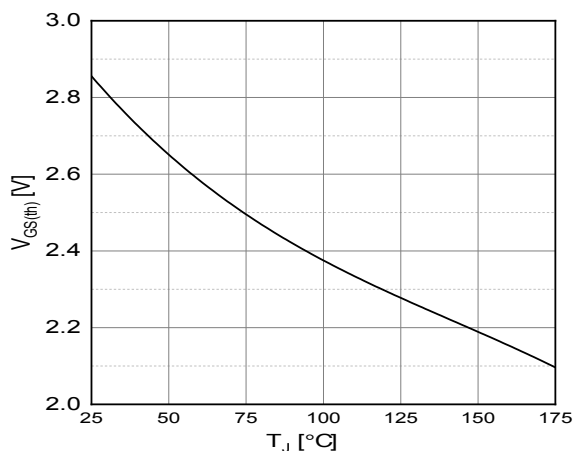
Body Diode Characteristics

$I_{DS}=f(V_{DS})$, $T_J=175^{\circ}\text{C}$



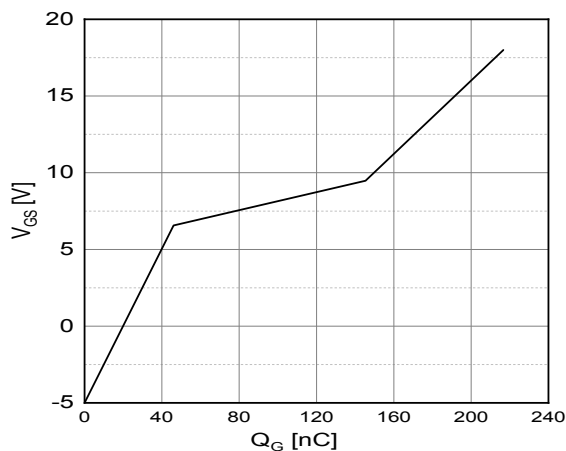
Threshold Voltage

$V_{GS(th)}=f(T_J)$, $V_{GS}=V_{DS}$, $I_{DS}=20\text{mA}$



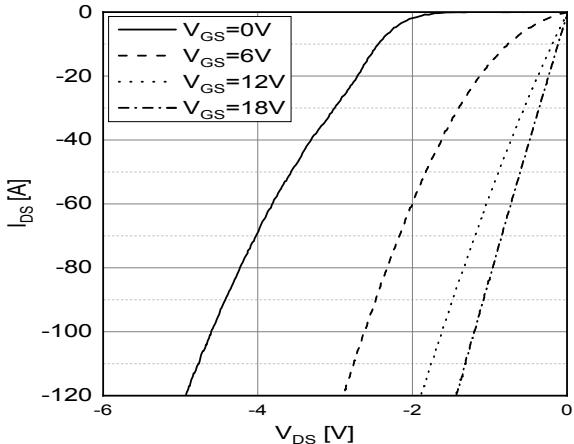
Gate Charge Characteristics

$V_{GS}=f(Q_G)$, $I_{DS}=75\text{A}$, $I_{GS}=50\text{mA}$, $V_{DS}=800\text{V}$, $T_J=25^{\circ}\text{C}$



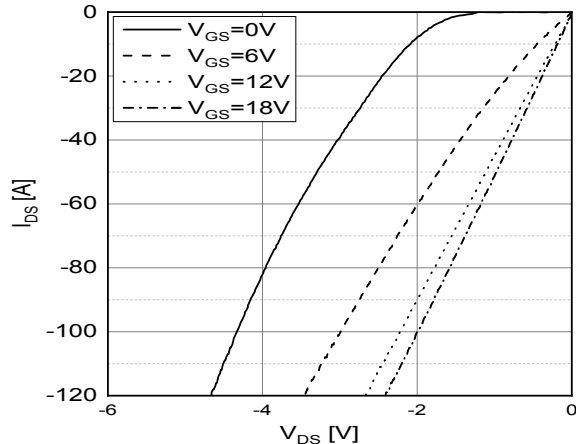
3rd Quadrant Characteristics

$I_{DS}=f(V_{DS})$, $T_J=25^{\circ}\text{C}$



3rd Quadrant Characteristics

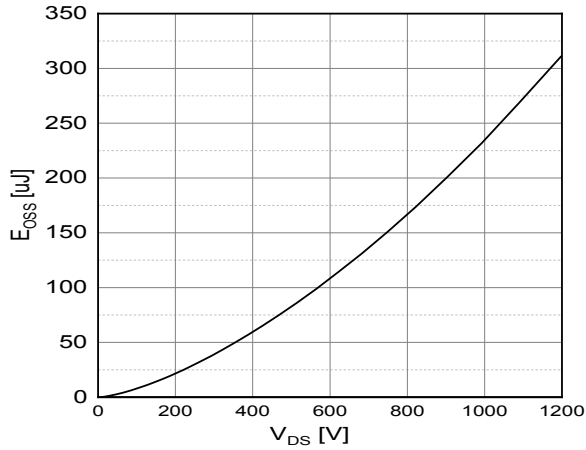
$I_{DS}=f(V_{DS})$, $T_J=175^{\circ}\text{C}$





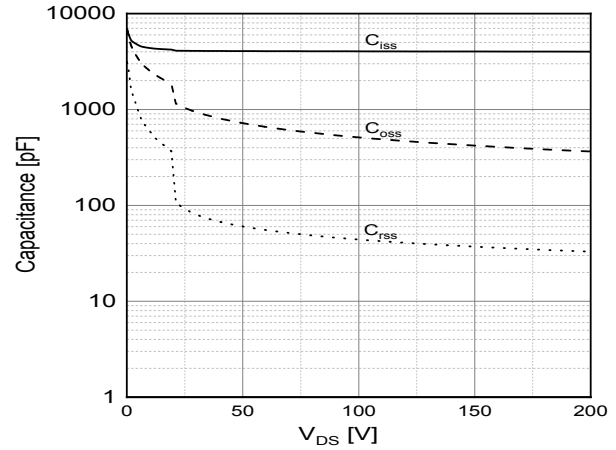
Output Capacitor Stored Energy

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



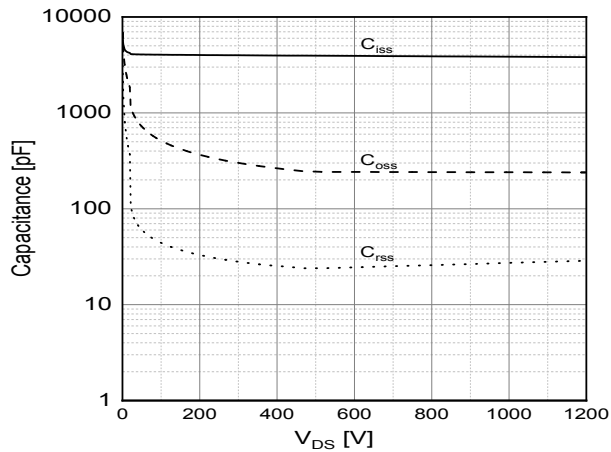
Capacitances

$$\text{Capacitances}=f(V_{DS}), T_J=25^{\circ}\text{C}, V_{AC}=25\text{mV}, f=100\text{KHz}, (0-200\text{V})$$



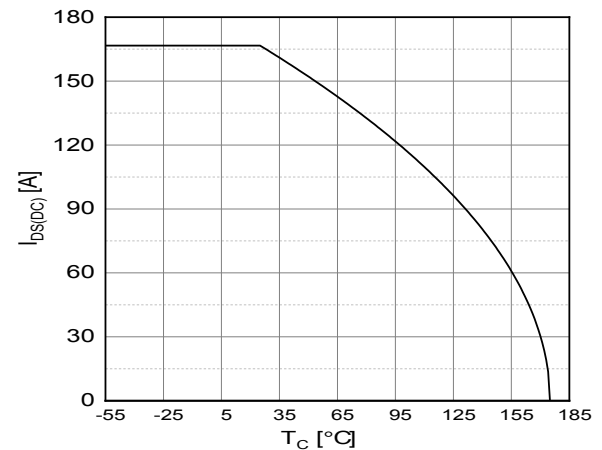
Capacitances

$$\text{Capacitances}=f(V_{DS}), T_J=25^{\circ}\text{C}, V_{AC}=25\text{mV}, f=100\text{KHz}, (0-1200\text{V})$$



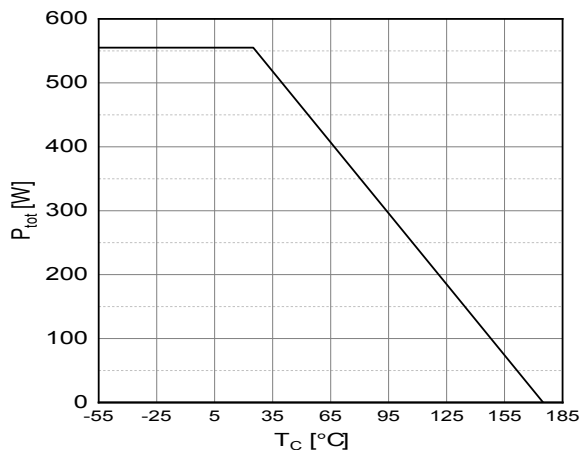
Continuous Drain Current Derating

$$I_{DS(DC)}=f(T_C), T_J\leq 175^{\circ}\text{C}$$



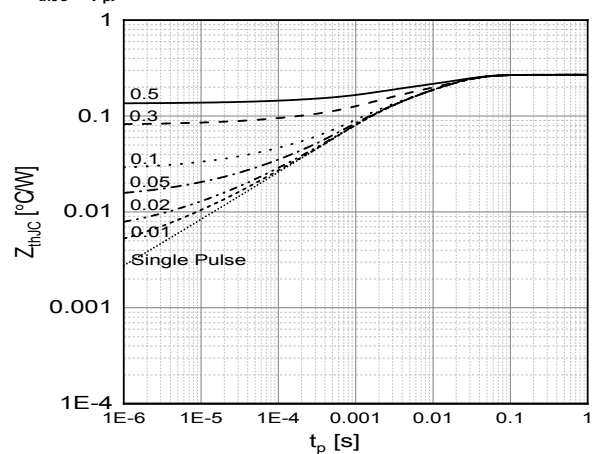
Maximum Power Dissipation Derating

$$P_{tot}=f(T_C), T_J\leq 175^{\circ}\text{C}$$



Transient Thermal Impedance (Junction-Case)

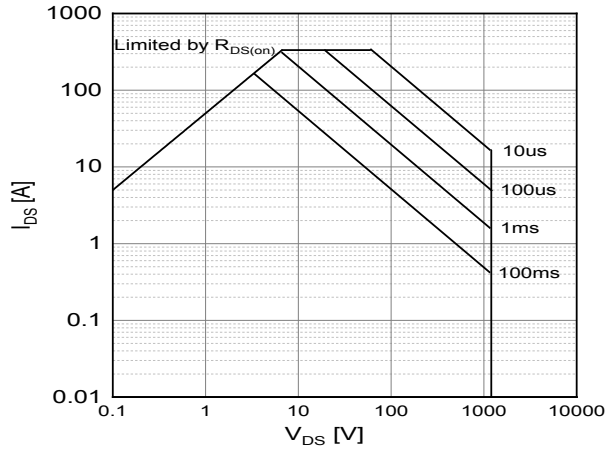
$$Z_{thJC}=f(t_p)$$





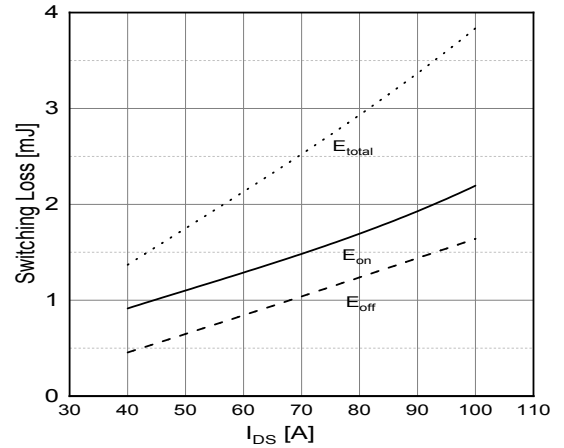
Safe Operating Area

$I_{DS}=f(V_{DS}, T_C=25^{\circ}\text{C}, D=0, \text{Parameter: } t_p)$



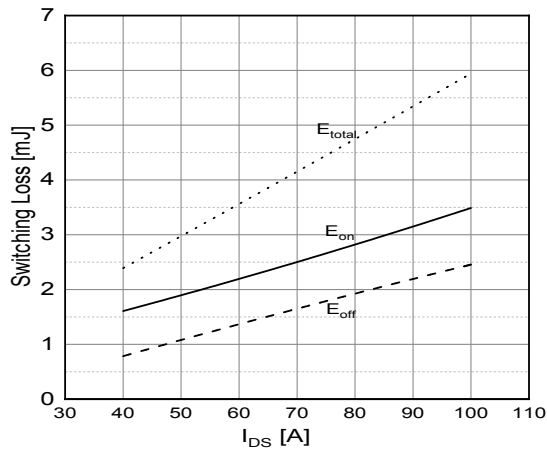
Switching Energy

Switching Loss= $f(I_{DS})$, $T_J=25^{\circ}\text{C}$, $V_{DD}=600\text{V}$, $R_{G(\text{ext})}=2.5\Omega$, $V_{GS}=-5\text{V}/+18\text{V}$, $L=150\mu\text{H}$



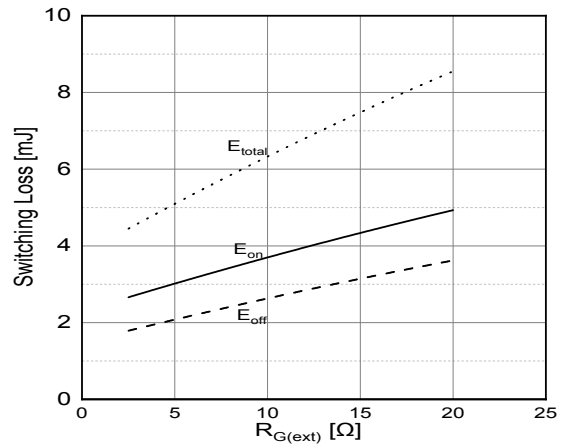
Switching Energy

Switching Loss= $f(I_{DS})$, $T_J=25^{\circ}\text{C}$, $V_{DD}=800\text{V}$, $R_{G(\text{ext})}=2.5\Omega$, $V_{GS}=-5\text{V}/+18\text{V}$, $L=150\mu\text{H}$



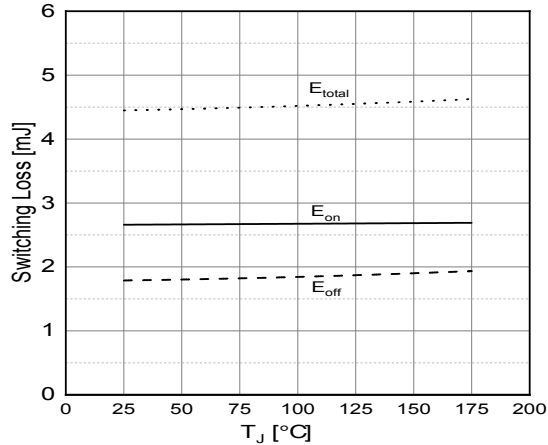
Switching Energy

Switching Loss= $f(R_{G(\text{ext})})$, $T_J=25^{\circ}\text{C}$, $V_{DD}=800\text{V}$, $I_{DS}=75\text{A}$, $V_{GS}=-5\text{V}/+18\text{V}$, $L=150\mu\text{H}$



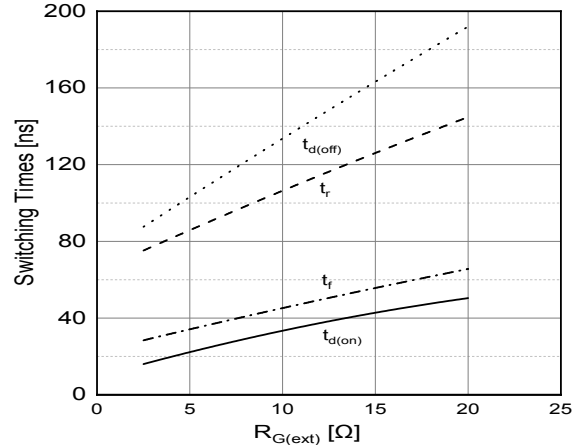
Switching Energy

Switching Loss= $f(T_J)$, $V_{DD}=800\text{V}$, $I_{DS}=75\text{A}$, $R_{G(\text{ext})}=2.5\Omega$, $V_{GS}=-5\text{V}/+18\text{V}$, $L=150\mu\text{H}$



Switching Times

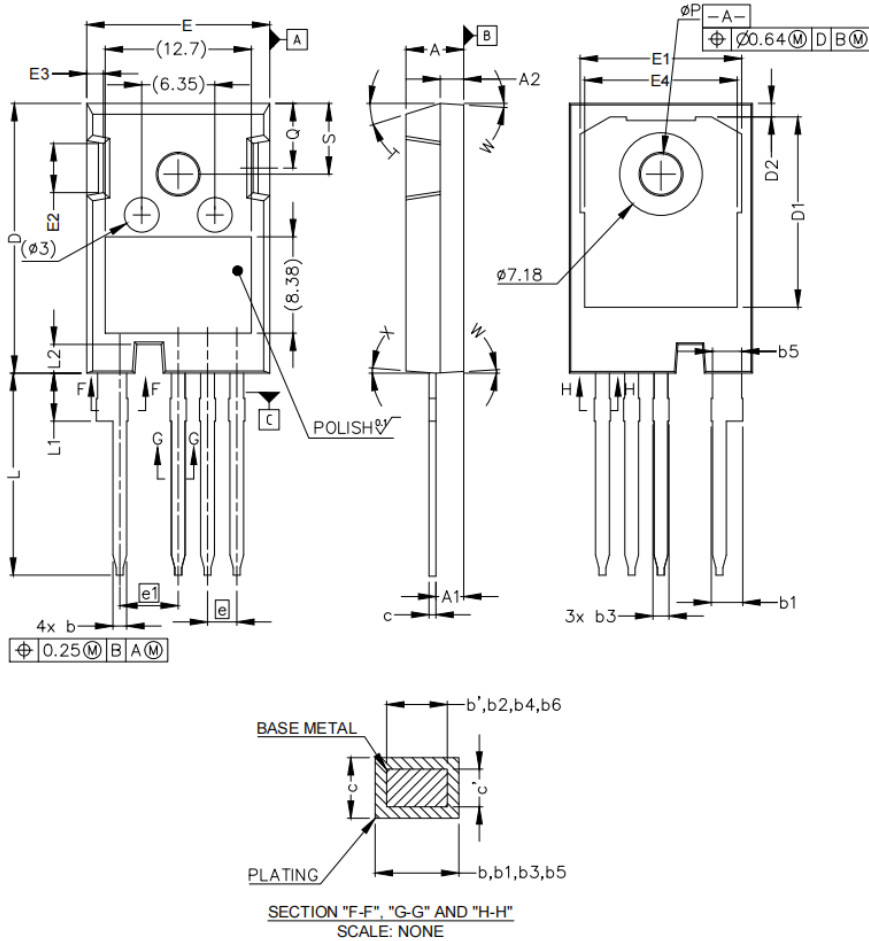
Switching Times= $f(R_{G(\text{ext})})$, $T_J=25^{\circ}\text{C}$, $V_{DD}=800\text{V}$, $I_{DS}=75\text{A}$, $V_{GS}=-5\text{V}/+18\text{V}$, $L=150\mu\text{H}$





Package Dimensions

Package TO-247H-4L



SYMBOL	MILLIMETERS	
	MIN	MAX
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b'	1.07	1.28
b	1.07	1.33
b1	2.39	2.94
b2	2.39	2.84
b3	1.07	1.60
b4	1.07	1.50
b5	2.39	2.69
b6	2.39	2.64
c'	0.55	0.65
c	0.55	0.68
D	23.30	23.60
D1	16.25	17.65
D2	0.95	1.25
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	2.54 BSC	
e1	5.08 BSC	
N	4	
L	17.31	17.82
L1	3.97	4.37
L2	2.35	2.65
øP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF.	
W	3.5° REF.	
X	4° REF.	



Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.