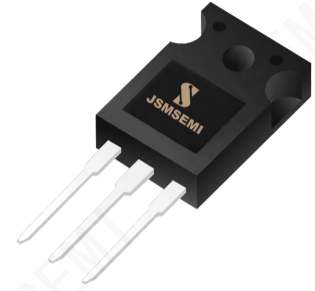


Product Summary

- V_{DS} 500V
- I_D 25A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<0.3\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

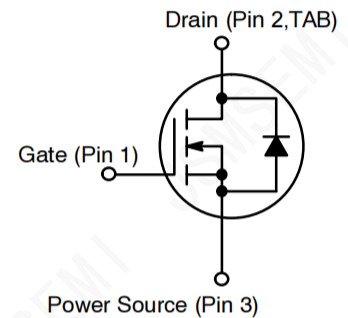


General Description

- Trench Power MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor
- Motor drivers



Absolute Maximum Ratings $T_C = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Value	Unit
		TO-247	
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	500	V
Continuous Drain Current	I_D	25	A
Pulsed Drain Current (note1)	I_{DM}	75	A
Gate-Source Voltage	V_{GSS}	± 30	V
Single Pulse Avalanche Energy (note2)	E_{AS}	980	mJ
Avalanche Current (note1)	I_{AS}	14	A
Repetitive Avalanche Energy (note1)	E_{AR}	588	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	350	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Value	Unit
		TO-247	
Thermal Resistance, Junction-to-Case	R_{thJC}	0.6	KW
Thermal Resistance, Junction-to-Ambient	R_{thJA}	40	

Ordering Information

Ordernumber	Package	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
IXTQ460P2-JSM	TO-247	-55 to 150°C	1	TUBE,450	Rohs

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	500	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 500V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 30V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	3.0	--	4.0	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 9A$	--	0.25	0.3	Ω
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 25V,$ $f = 1.0\text{MHz}$	--	2367	--	pF
Output Capacitance	C_{oss}		--	228	--	
Reverse Transfer Capacitance	C_{rss}		--	15	--	
Total Gate Charge	Q_g	$V_{DD} = 400V, I_D = 18A,$ $V_{GS} = 10V$	--	53.4	--	nC
Gate-Source Charge	Q_{gs}		--	10	--	
Gate-Drain Charge	Q_{gd}		--	20	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 250V, I_D = 18A,$ $R_G = 25\Omega$	--	51.3	--	ns
Turn-on Rise Time	t_r		--	36.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	232	--	
Turn-off Fall Time	t_f		--	61	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	25	A
Pulsed Diode Forward Current	I_{SM}		--	--	75	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 9A, V_{GS} = 0V$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V, I_S = 18A,$ $di_F/dt = 100A/\mu s$	--	497	--	ns
Reverse Recovery Charge	Q_{rr}		--	4	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 10\text{mH}, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

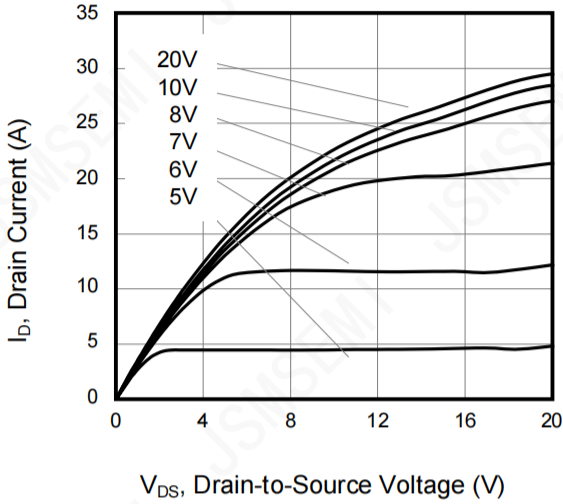


Figure 2. Body Diode Forward Voltage

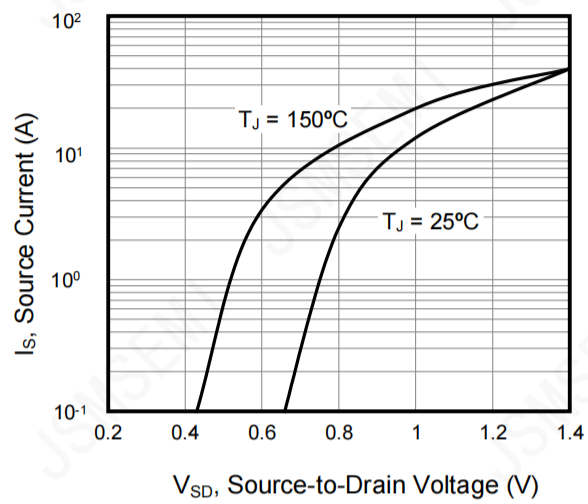


Figure 3. Drain Current vs. Temperature

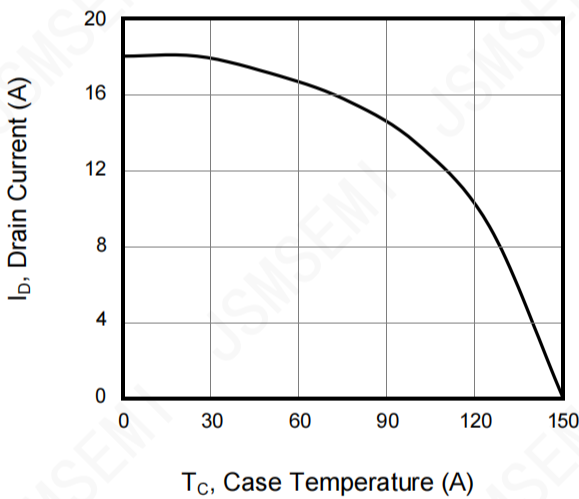


Figure 4. BV_{DSS} Variation vs. Temperature

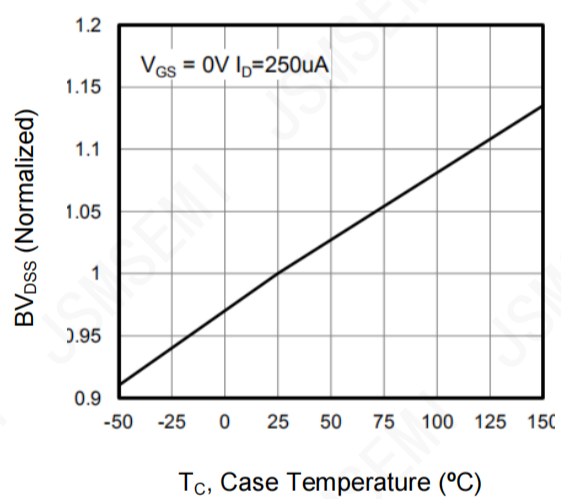


Figure 5. Transfer Characteristics

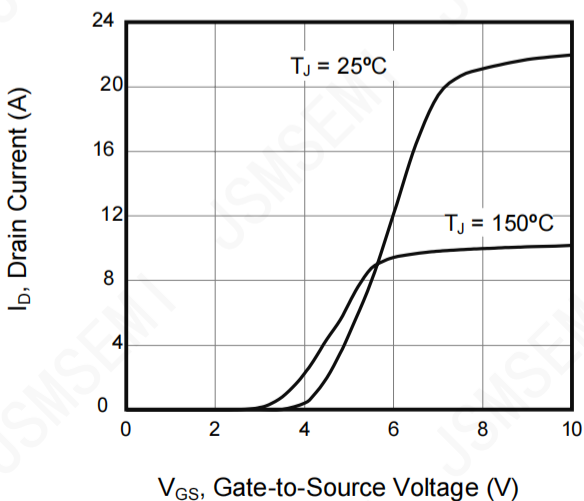
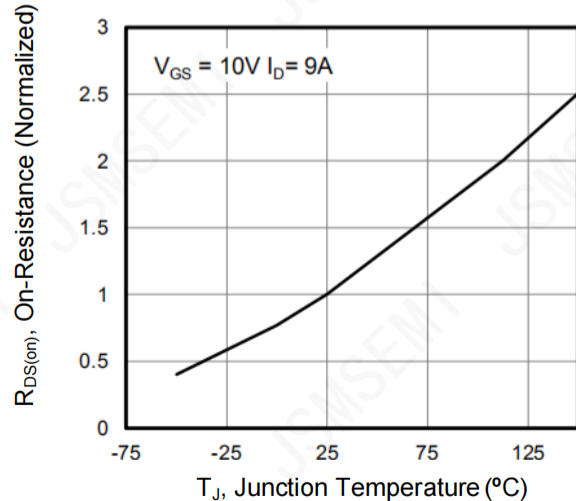


Figure 6. On-Resistance vs. Temperature



Typical Characteristics $T_j = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Capacitance

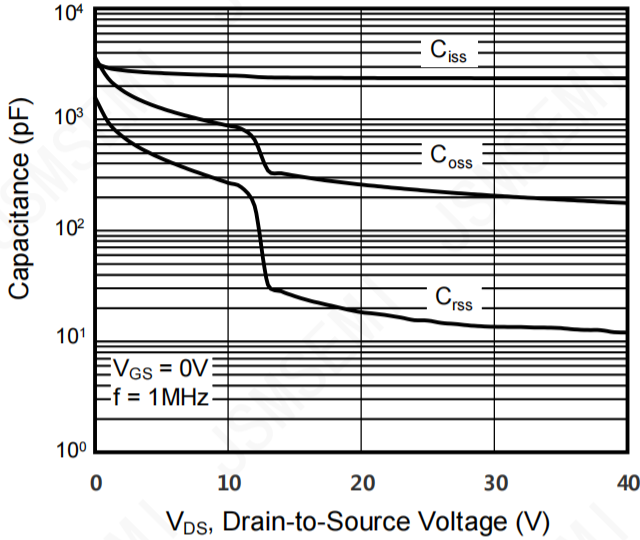


Figure 8. Gate Charge

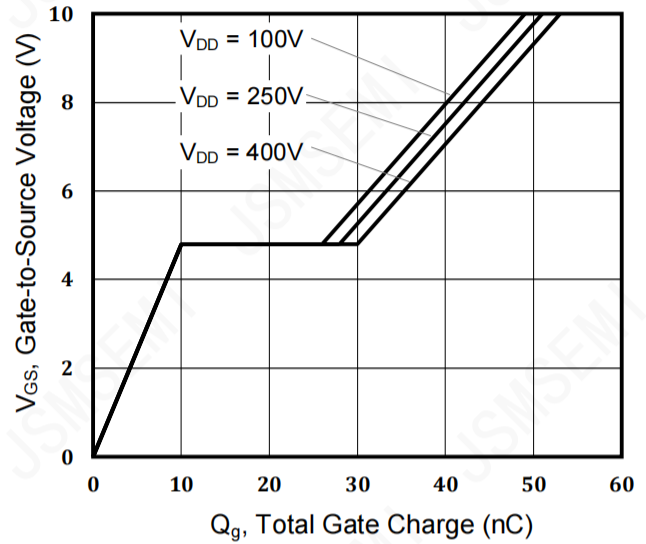


Figure 9. Transient Thermal Impedance TO-220F

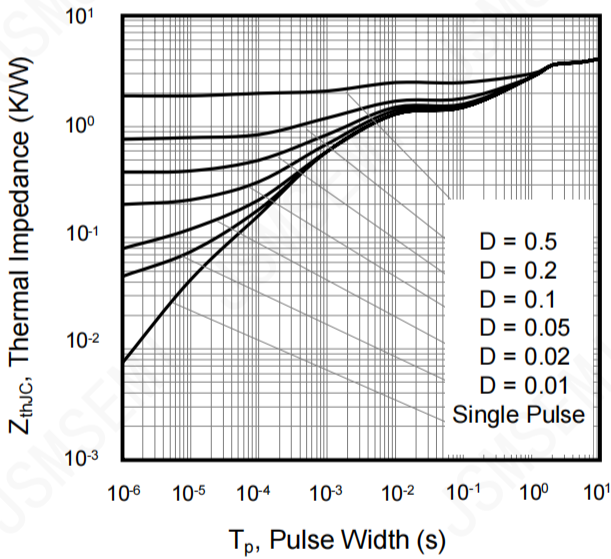


Figure 10. Transient Thermal Impedance TO-220, TO-3P

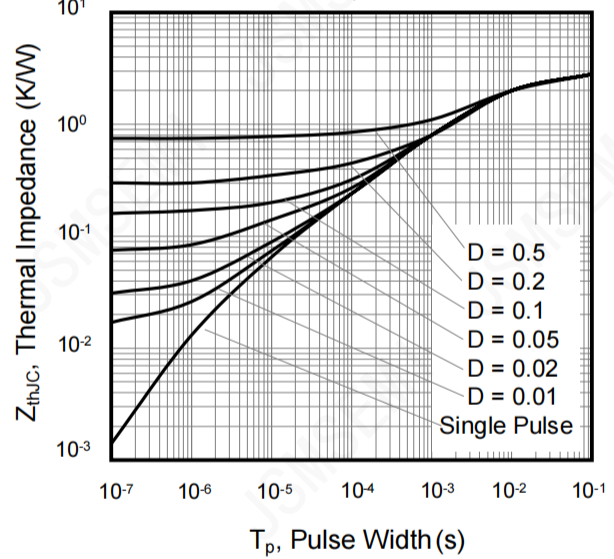


Figure A: Gate Charge Test Circuit and Waveform

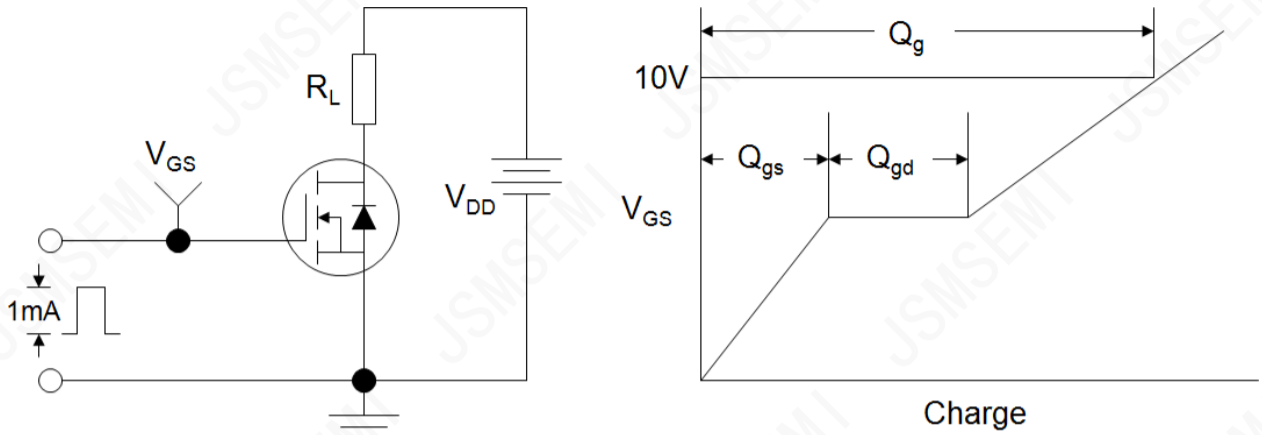


Figure B: Resistive Switching Test Circuit and Waveform

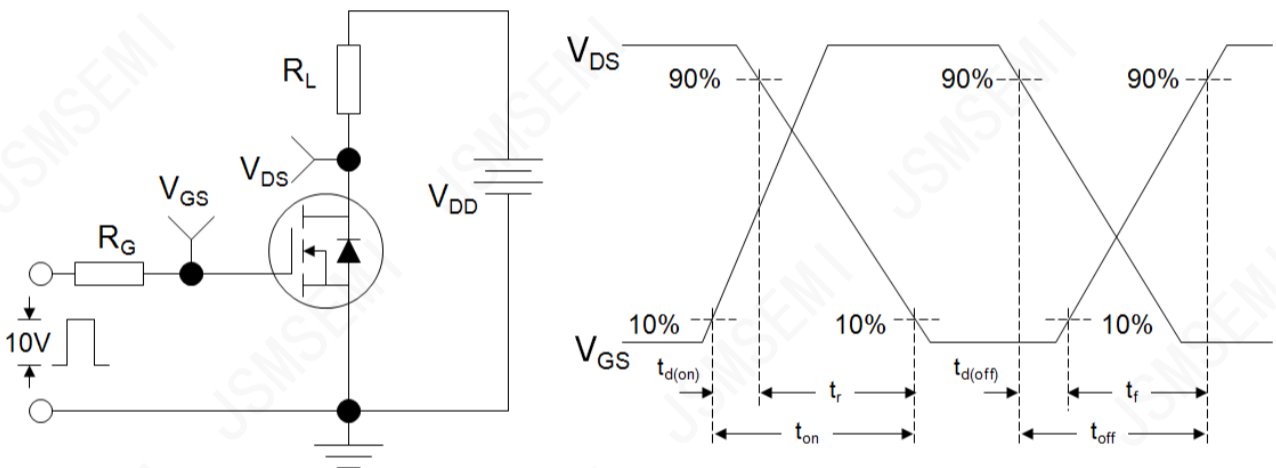
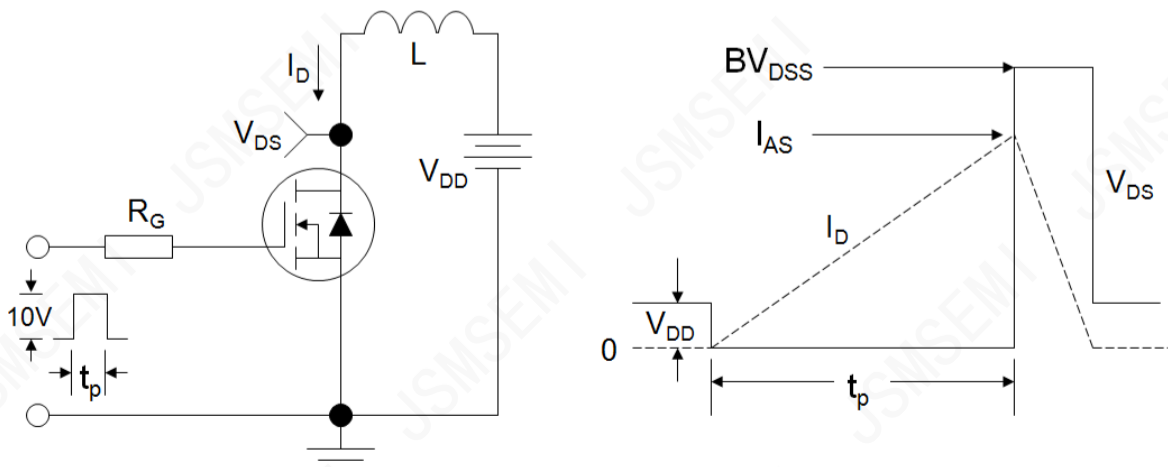
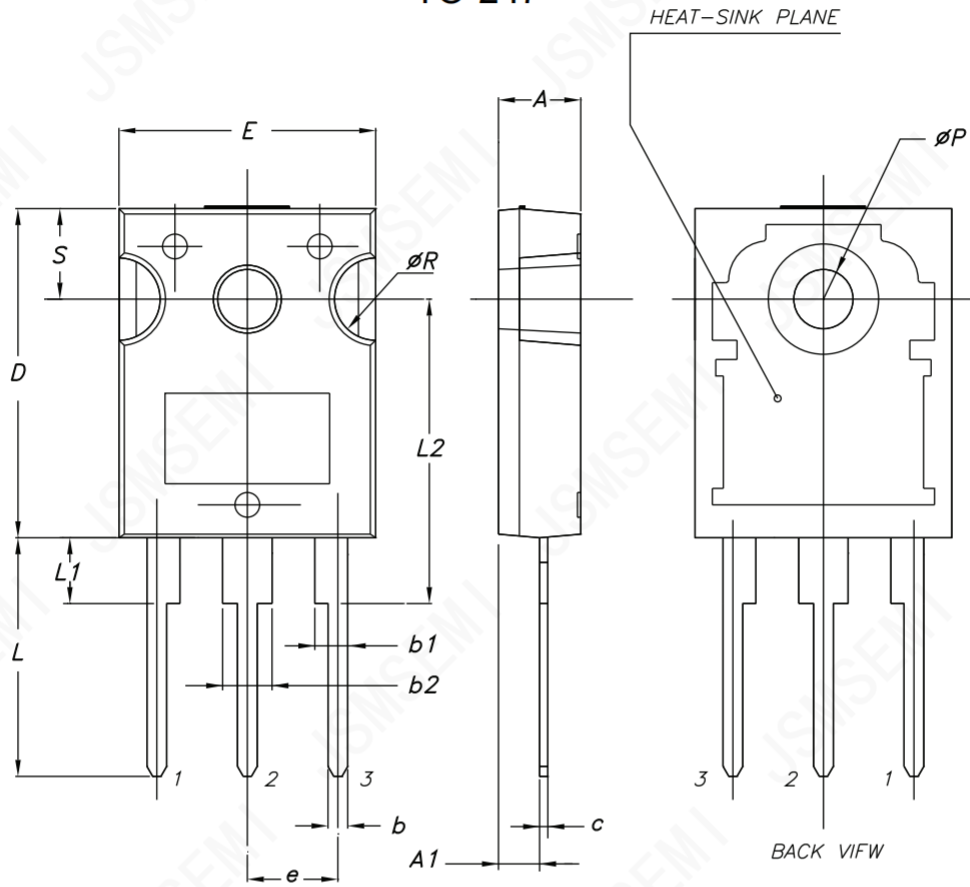


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Package Information

TO-247



Dim.	mm.		
	Min.	Typ.	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e	5.30	5.45	5.60
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
ØP	3.55		3.65
ØR	4.50		5.50
S	5.30	5.50	5.70