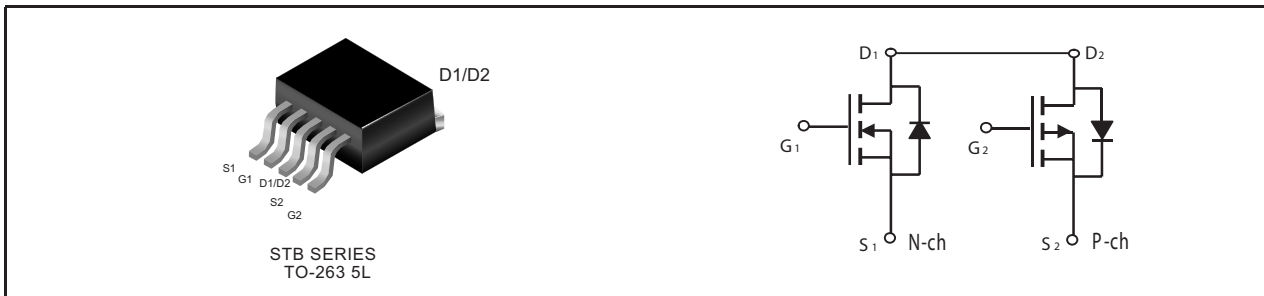


**Dual Enhancement Mode Field Effect Transistor (N and P Channel)**

PRODUCT SUMMARY (N-Channel)		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
40V	18A	28 @ V _{GS} =10V
		43 @ V _{GS} =4.5V

PRODUCT SUMMARY (P-Channel)		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
-40V	-16A	36 @ V _{GS} =-10V
		61 @ V _{GS} =-4.5V

**ABSOLUTE MAXIMUM RATINGS** (T_C=25°C unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units	
V _{DS}	Drain-Source Voltage	40	-40	V	
V _{GS}	Gate-Source Voltage	±20	±20	V	
I _D	Drain Current-Continuous ^a	T _C =25°C	18	-16	A
		T _C =70°C	14.4	-12.8	A
I _{DM}	-Pulsed ^b	40	-40	A	
E _{AS}	Single Pulse Avalanche Energy ^d	36	64	mJ	
P _D	Maximum Power Dissipation ^a	T _C =25°C	15.6		W
		T _C =70°C	10		W
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150		°C	

THERMAL CHARACTERISTICS

R _{θJC}	Thermal Resistance, Junction-to-Case	8	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	80	°C/W

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N-Channel ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V , V _{GS} =0V			1	A
I _{GSS}	Gate-Body leakage current	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	1.9	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =9A		22	28	m ohm
		V _{GS} =4.5V , I _D =7.5A		32	43	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =9A		20		S
DYNAMIC CHARACTERISTICS [°]						
C _{ISS}	Input Capacitance	V _{DS} =20V, V _{GS} =0V f=1.0MHz		700		pF
C _{OSS}	Output Capacitance			78		pF
C _{RSS}	Reverse Transfer Capacitance			60		pF
SWITCHING CHARACTERISTICS [°]						
t _{D(ON)}	Turn-On DelayTime	V _{DD} =20V I _D =1A V _{GS} =10V R _{GEN} =6 ohm		13.5		ns
t _r	Rise Time			12.2		ns
t _{D(OFF)}	Turn-Off DelayTime			17		ns
t _f	Fall Time			19.5		ns
Q _g	Total Gate Charge	V _{DS} =20V, I _D =9A, V _{GS} =10V		11.5		nC
		V _{DS} =20V, I _D =9A, V _{GS} =4.5V		5.7		nC
Q _{gs}	Gate-Source Charge	V _{DS} =20V, I _D =9A, V _{GS} =10V		1.3		nC
Q _{gd}	Gate-Drain Charge			3.2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =2A		0.8	1.3	V

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P-Channel ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-32V, V _{GS} =0V			-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-2	-3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-8A		29	36	m ohm
		V _{GS} =-4.5V, I _D =-6.5A		45	61	m ohm
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-8A		29		S
DYNAMIC CHARACTERISTICS ^c						
C _{iss}	Input Capacitance	V _{DS} =-20V, V _{GS} =0V f=1.0MHz		1050		pF
C _{oss}	Output Capacitance			125		pF
C _{RSS}	Reverse Transfer Capacitance			101		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =-20V I _D =-1A V _{GS} =-10V R _{GEN} =6 ohm		17.5		ns
t _r	Rise Time			20		ns
t _{D(OFF)}	Turn-Off Delay Time			63.2		ns
t _f	Fall Time			30.5		ns
Q _g	Total Gate Charge	V _{DS} =-20V, I _D =-8A, V _{GS} =-10V		22.5		nC
		V _{DS} =-20V, I _D =-8A, V _{GS} =-4.5V		11.1		nC
Q _{gs}	Gate-Source Charge	V _{DS} =-20V, I _D =-8A, V _{GS} =-10V		2		nC
Q _{gd}	Gate-Drain Charge			6.2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-2A		-0.79	-1.2	V

Notes

- Surface Mounted on FR4 Board, t ≤ 10sec.
- Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Starting T_J=25°C, L=0.5mH, V_{DD} = 20V, V_{GS}=10V. (See Figure13)

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N-Channel

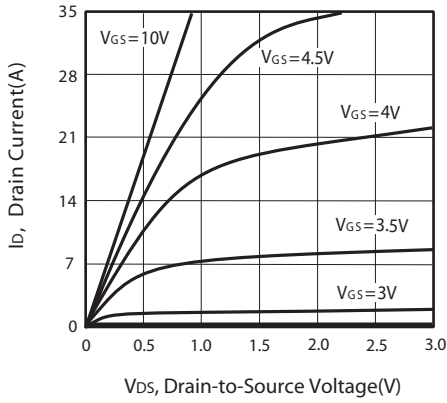


Figure 1. Output Characteristics

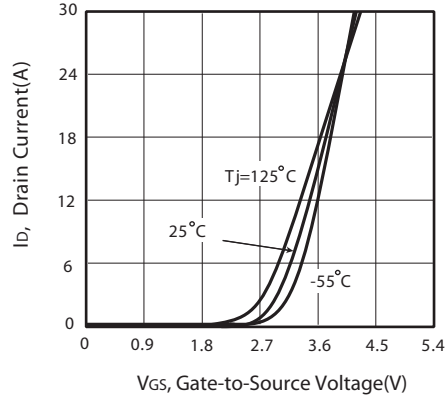


Figure 2. Transfer Characteristics

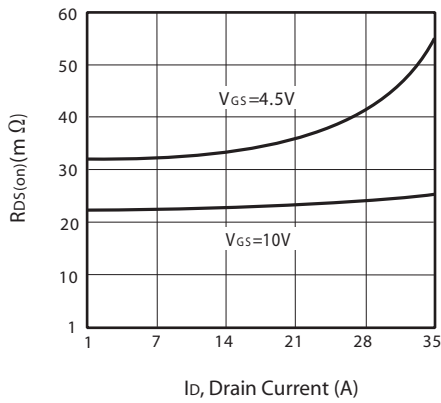


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

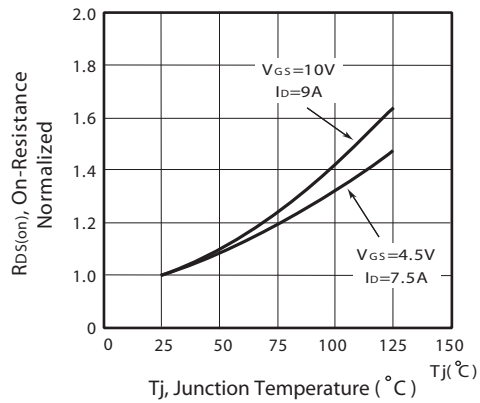


Figure 4. On-Resistance Variation with Drain Current and Temperature

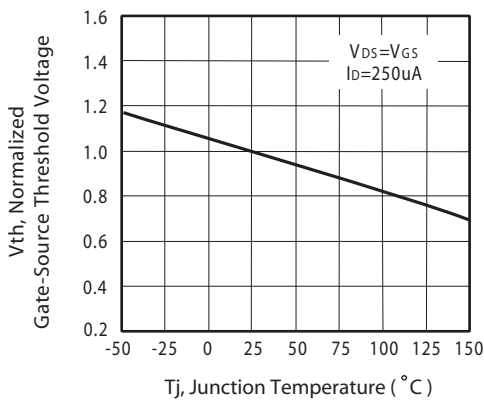


Figure 5. Gate Threshold Variation with Temperature

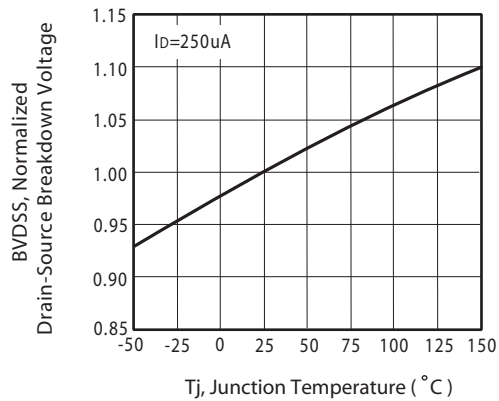


Figure 6. Breakdown Voltage Variation with Temperature

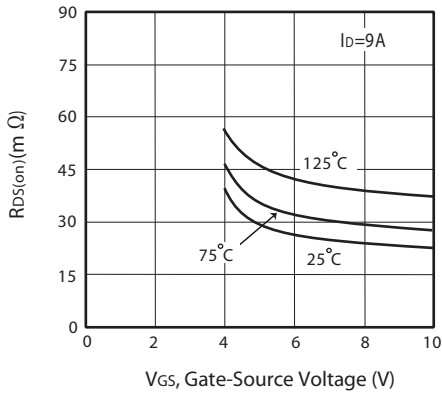


Figure 7. On-Resistance vs. Gate-Source Voltage

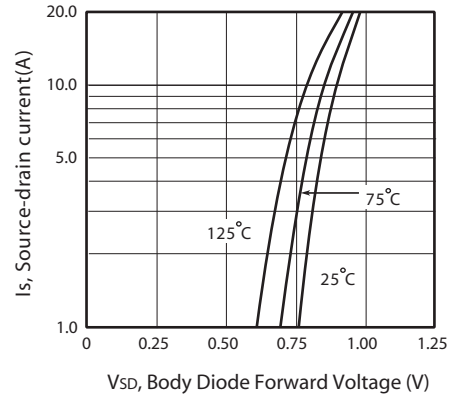


Figure 8. Body Diode Forward Voltage Variation with Source Current

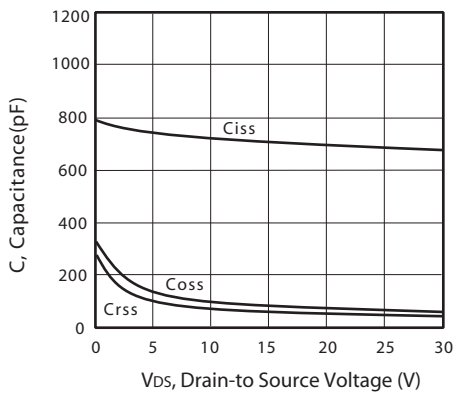


Figure 9. Capacitance

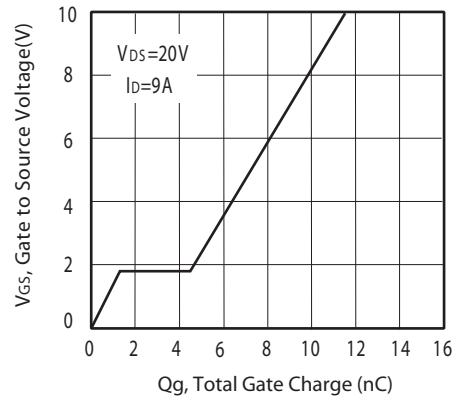


Figure 10. Gate Charge

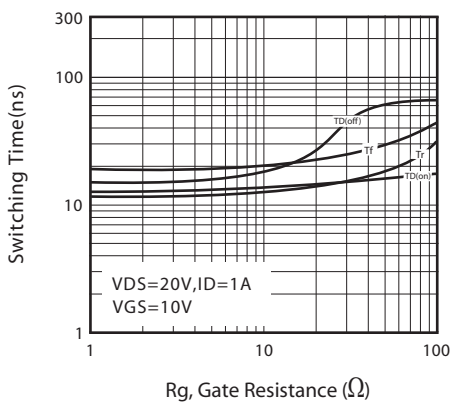


Figure 11. Switching Characteristics

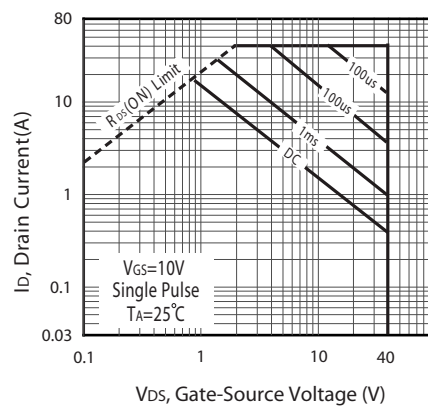
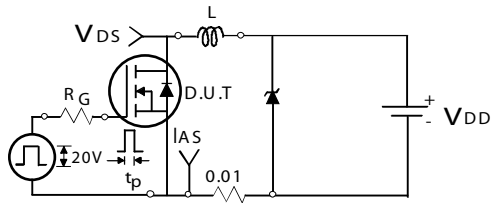
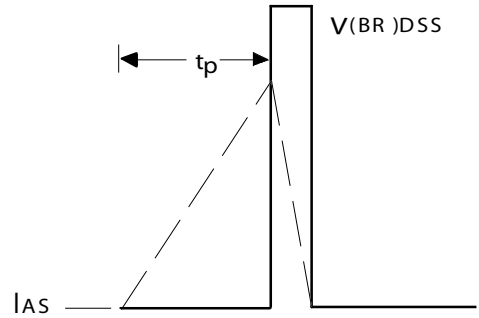


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

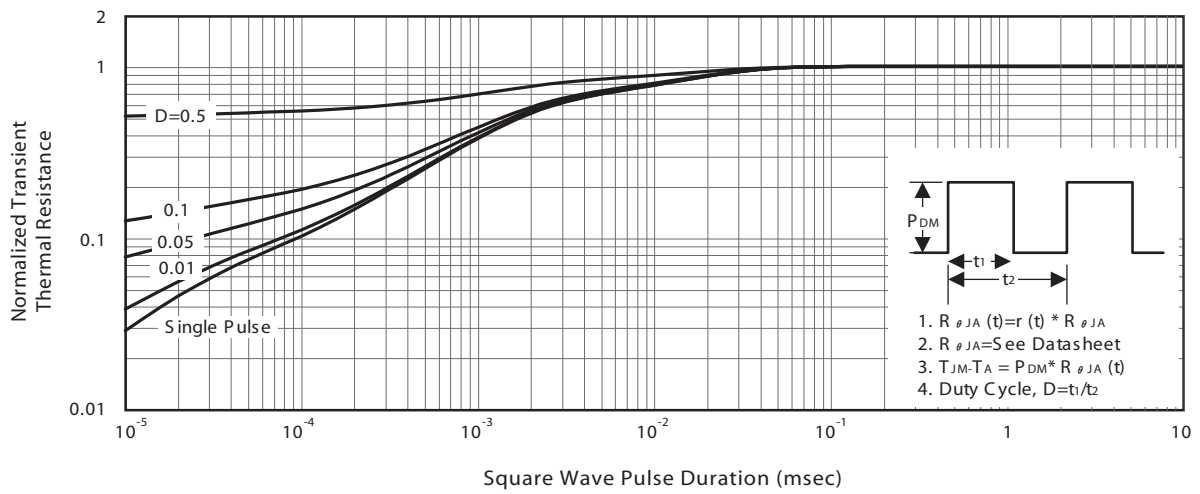


Figure 14. Normalized Thermal Transient Impedance Curve

P-Channel

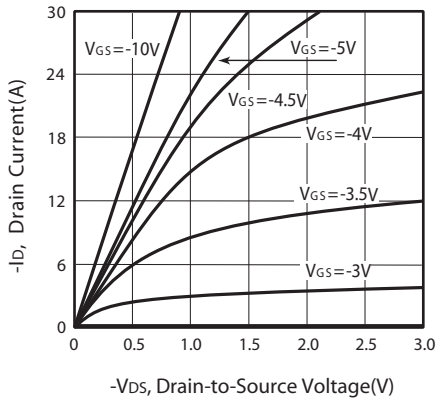


Figure 1. Output Characteristics

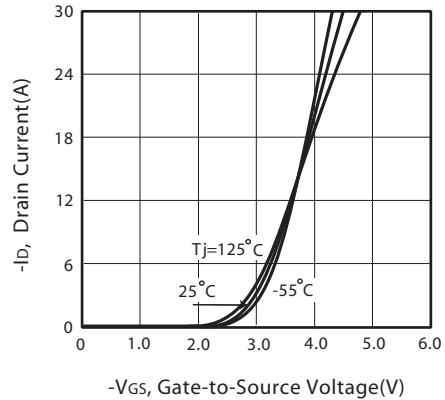


Figure 2. Transfer Characteristics

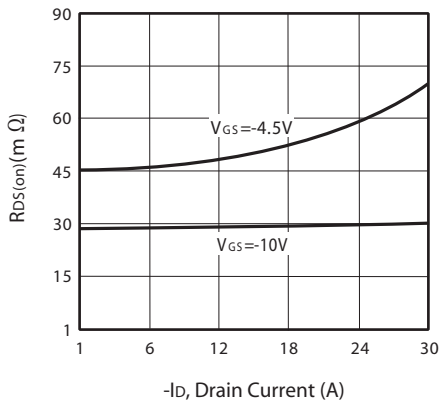


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

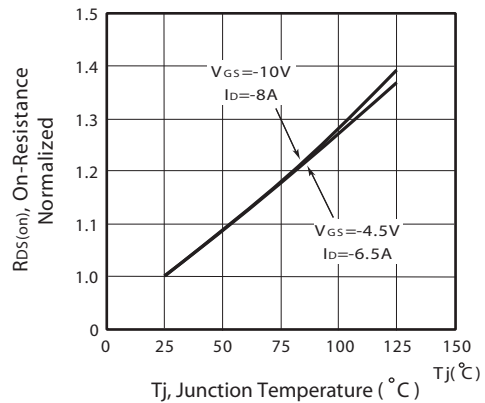


Figure 4. On-Resistance Variation with Drain Current and Temperature

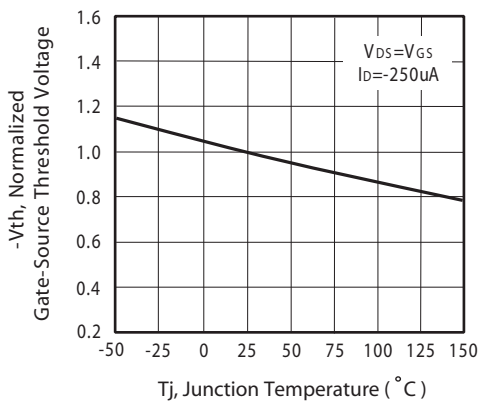


Figure 5. Gate Threshold Variation with Temperature

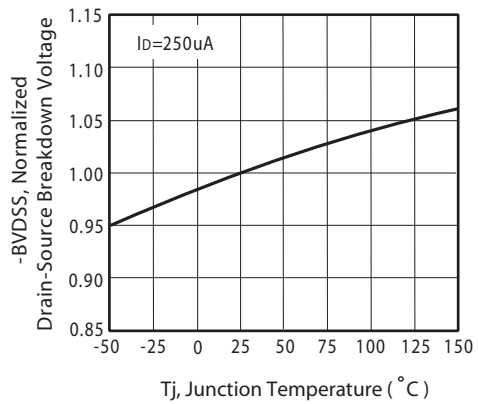


Figure 6. Breakdown Voltage Variation with Temperature

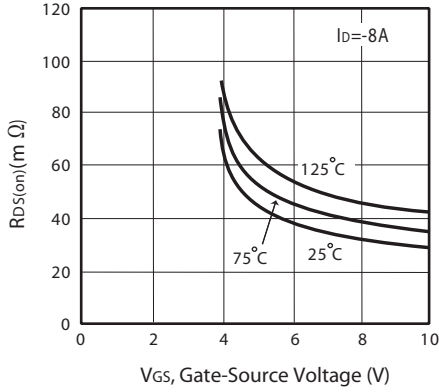


Figure 7. On-Resistance vs. Gate-Source Voltage

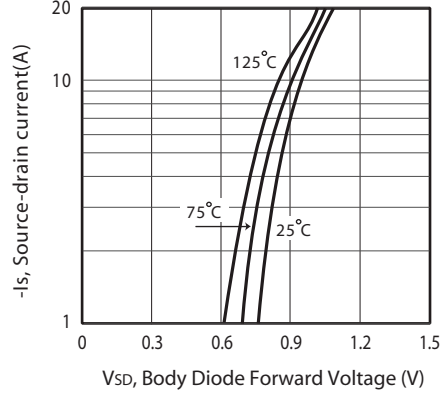


Figure 8. Body Diode Forward Voltage Variation with Source Current

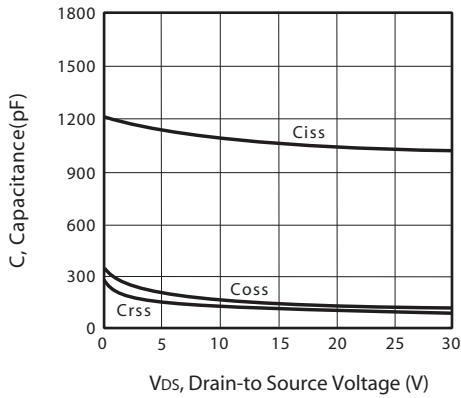


Figure 9. Capacitance

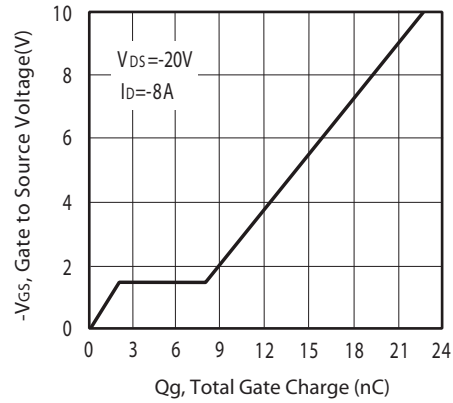


Figure 10. Gate Charge

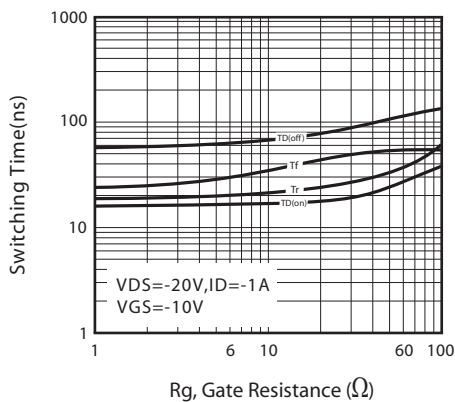


Figure 11. Switching Characteristics

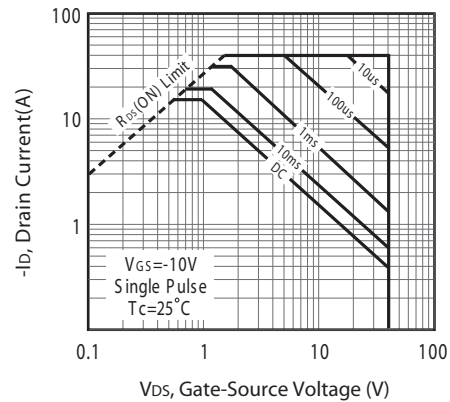
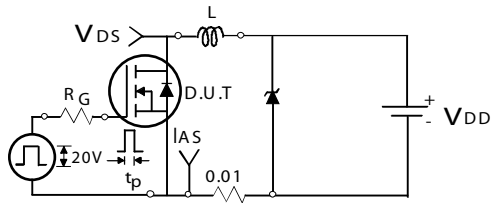
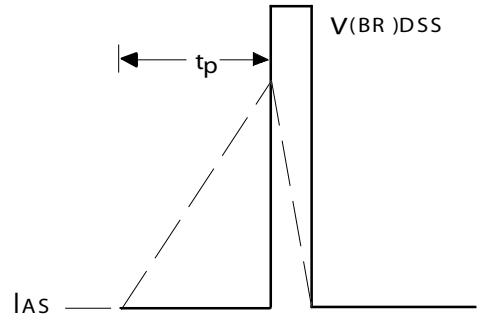


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

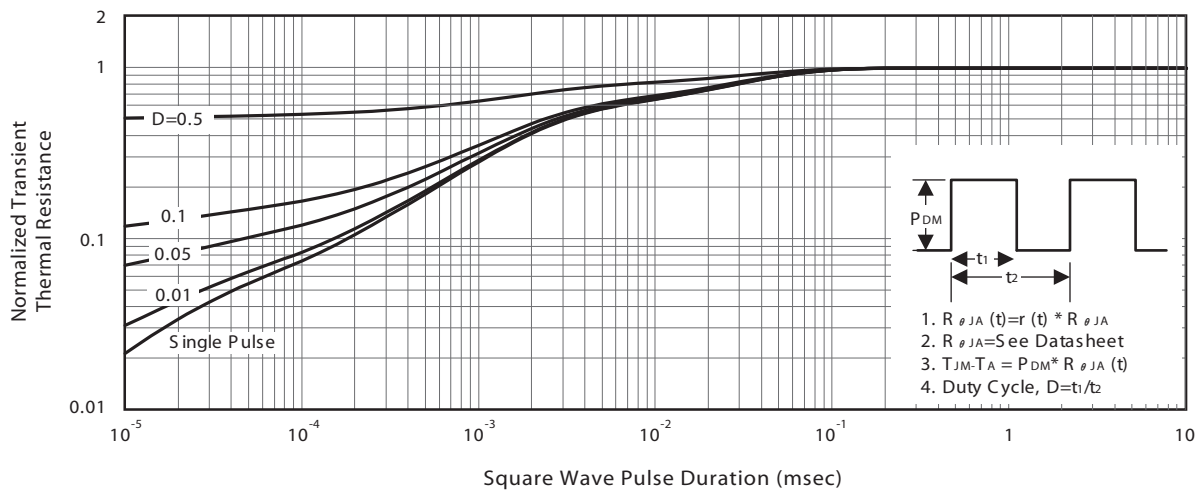


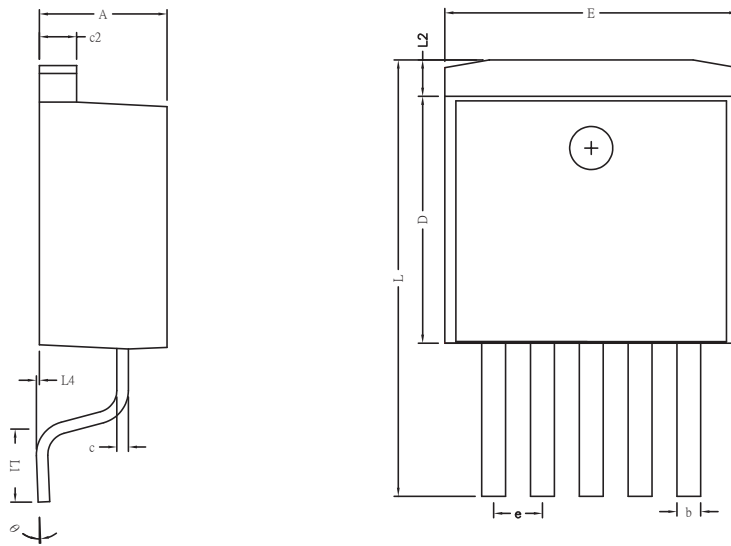
Figure 14. Normalized Thermal Transient Impedance Curve

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PACKAGE OUTLINE DIMENSIONS

TO-263AB



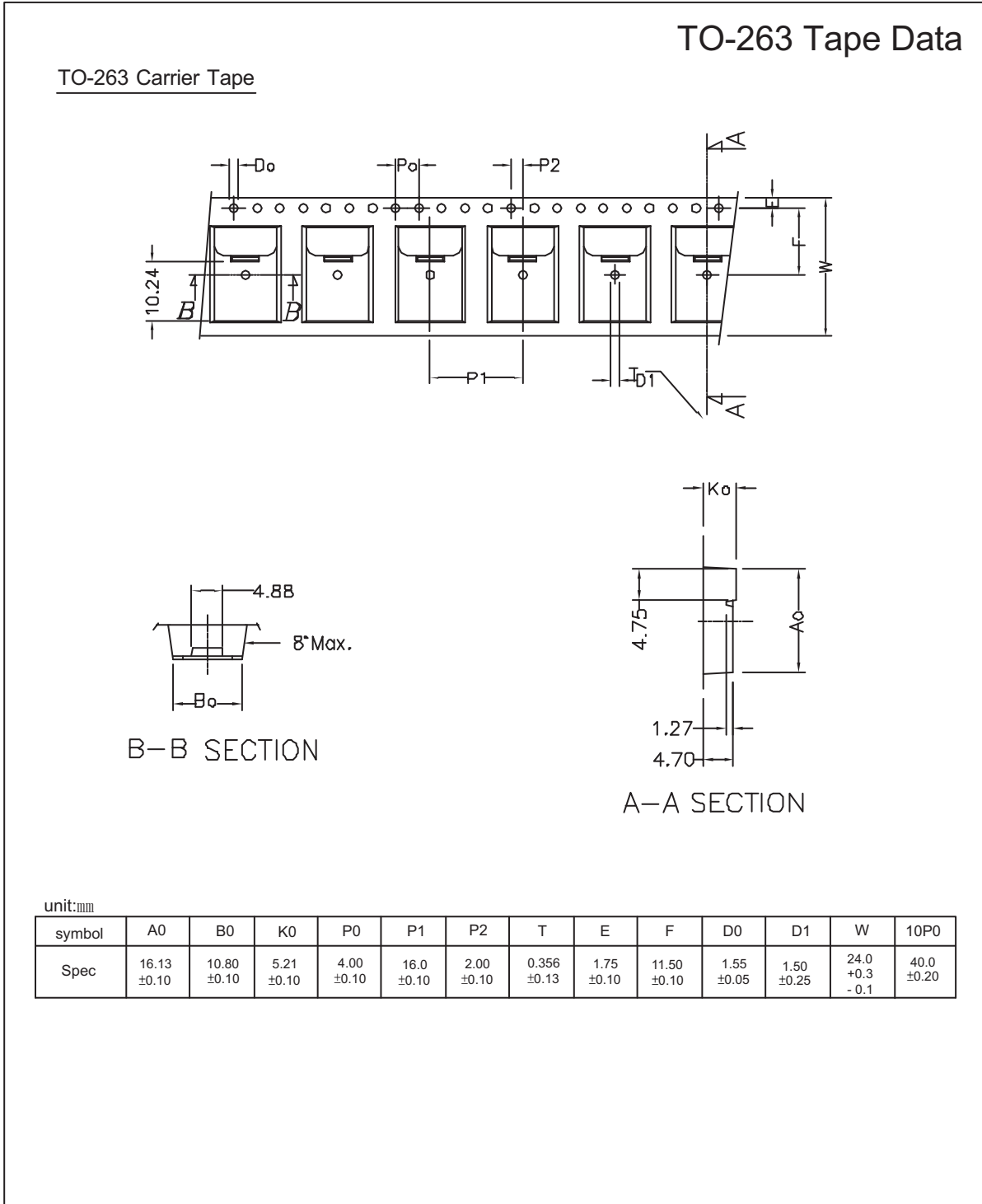
DIMENSIONS

REF.	MILLIMETERS	
	MIN	MAX
A	4.40	4.80
b	0.66	0.91
L4	0.00	0.30
C	0.36	0.50
L3	1.50 REF.	
L1	2.29	2.79
E	9.80	10.4
c2	1.25	1.45
L2	1.27 REF.	
D	8.60	9.00
e	1.70 REF.	
L	14.6	15.8
θ	0°	8°

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