SamHop Microelectronics Corp.

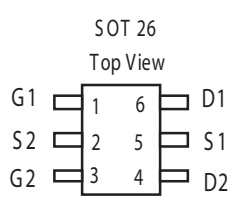
STS3621

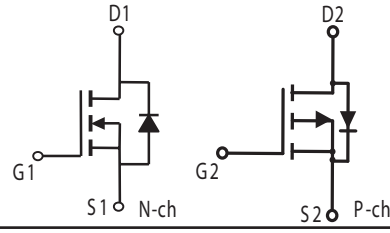
Oct. 24 2006

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

PRODUCT SUMMARY (N-Channel)		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
30V	3A	50 @ V_{GS} = 10V
		65 @ V_{GS} = 4.5V

PRODUCT SUMMARY (P-Channel)		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
-30V	-2A	90 @ V_{GS} = -10V
		135 @ V_{GS} = -4.5V





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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Drain Current-Continuous [a] @ Ta	25°C	I_D	3	-2	A
	70°C		2.7	1.8	A
-Pulsed [b]		I_{DM}	12	-8	A
Drain-Source Diode Forward Current [a]		I_S	1.25	-1.25	A
Maximum Power Dissipation [a]	Ta= 25°C	P_D	1.25		W
	Ta=70°C		0.8		
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150		°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient [a]	$R_{\theta JA}$	100	°C/W

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

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=± 20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.7	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A		40	50	m-ohm
		V_{GS}=4.5V, I_D=2A		52	65	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=4.5V	10			A
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=3A		9		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V f=1.0MHz		330		pF
Output Capacitance	C_{OSS}			70		pF
Reverse Transfer Capacitance	C_{RSS}			45		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=15V, I_D=1A, V_{GS}=10V, R_{GEN}=6 ohm		9		ns
Rise Time	t_r			9		ns
Turn-Off Delay Time	$t_{D(OFF)}$			15		ns
Fall Time	t_f			10		ns
Total Gate Charge	Q_g	V_{DS}=15V, I_D=3A, V_{GS}=10V		6		nC
		V_{DS}=15V, I_D=3A, V_{GS}=4.5V		3		nC
Gate-Source Charge	Q_{gs}	V_{DS}=15V, I_D=3A V_{GS}=10V		1		nC
Gate-Drain Charge	Q_{gd}			1.5		nC

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

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-1	-1.8	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-2A		75	90	m-ohm
		V_{GS}=-4.5V, I_D=-1A		120	135	m-ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	8			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-3A		5.5		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=-15V, V_{GS}=0V f=1.0MHz		360		pF
Output Capacitance	C_{OSS}			84		pF
Reverse Transfer Capacitance	C_{RSS}			52		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=-15V, I_D=-1A, V_{GEN}=-10V, R_{GEN}=6 ohm		6		ns
Rise Time	t_r			9.5		ns
Turn-Off Delay Time	$t_{D(OFF)}$			48		ns
Fall Time	t_f			25		ns
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-2A,V_{GS}=-10V		7		nC
		V_{DS}=-15V,I_D=-2A,V_{GS}=-4.5V		3.4		nC
Gate-Source Charge	Q_{gs}	V_{DS}=-15V, I_D=-2A V_{GS}=-10V		0.9		nC
Gate-Drain Charge	Q_{gd}			2.2		nC

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ [c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]							
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =1.25A	N-Ch		0.81	1.2	V
		V_{GS} = 0V, Is =-1.25A	P-Ch		-0.8	-1.2	

Notes

a.Surface Mounted on FR4 Board, t <=10sec.

b.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.

c.Guaranteed by design, not subject to production testing.

N-Channel

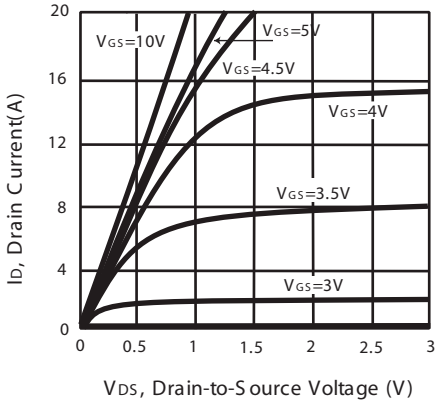

Figure 1. Output Characteristics

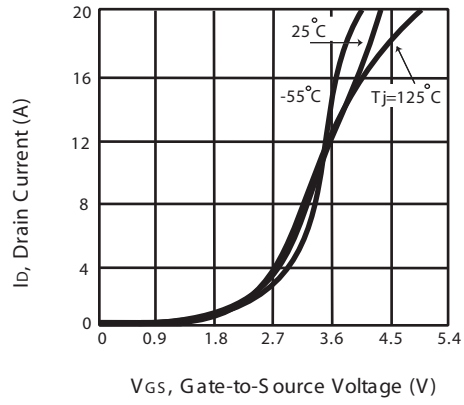

Figure 2. Transfer Characteristics

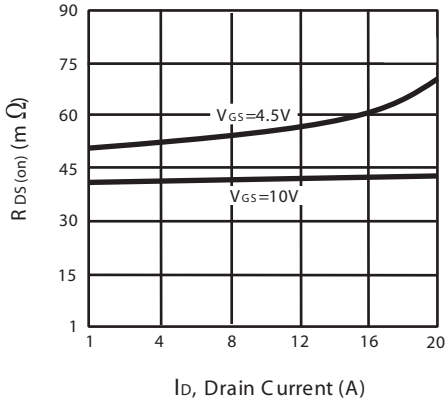

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

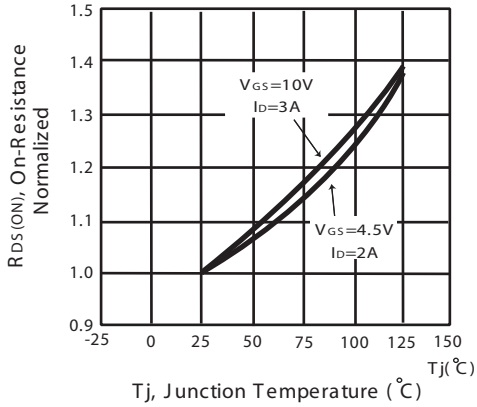

Figure 4. On-Resistance Variation with Drain Current and Temperature

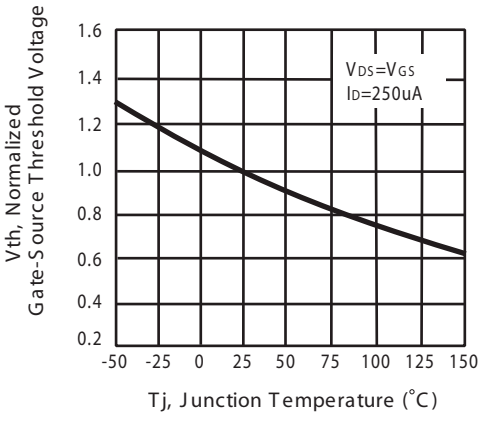

Figure 5. Gate Threshold Variation with Temperature

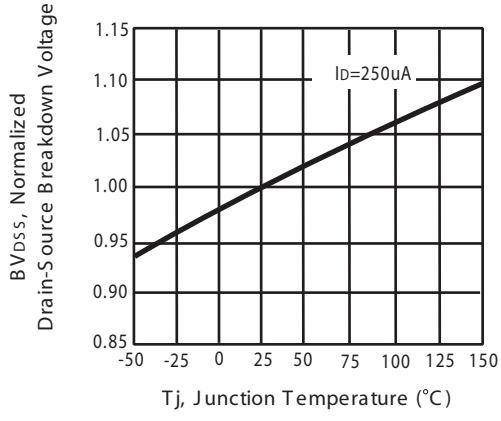

Figure 6. Breakdown Voltage Variation with Temperature

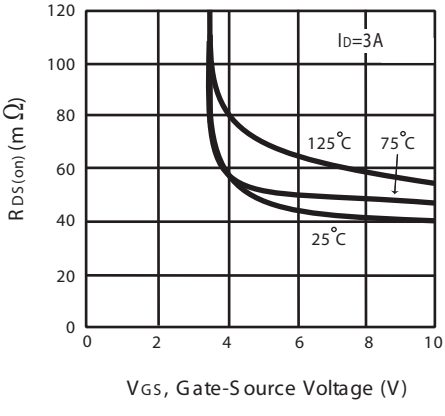

Figure 7. On-Resistance vs. Gate-Source Voltage

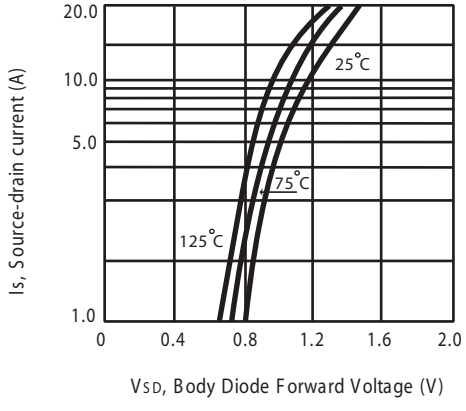

Figure 8. Body Diode Forward Voltage Variation with Source Current

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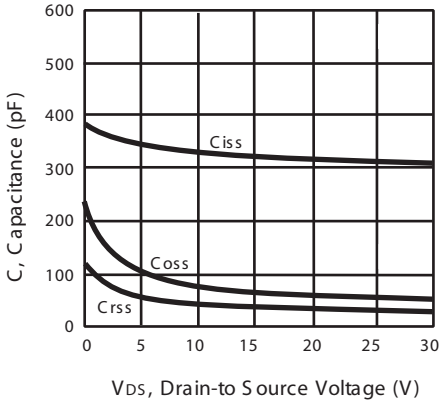


Figure 9. Capacitance

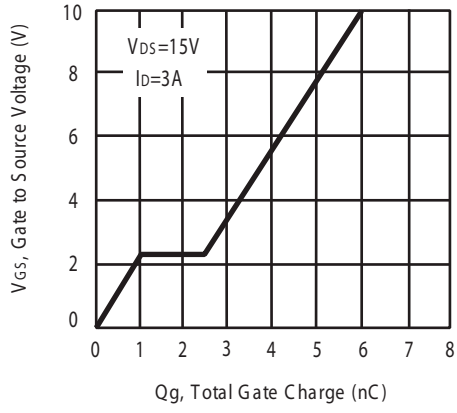


Figure 10. Gate Charge

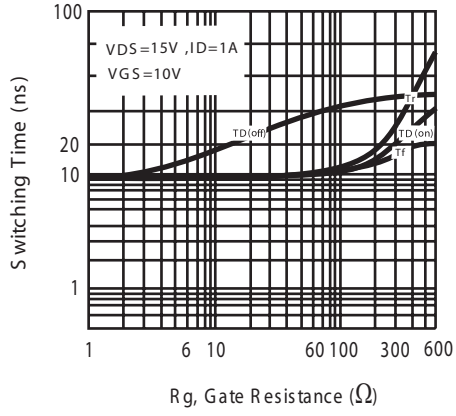


Figure 11.switching characteristics

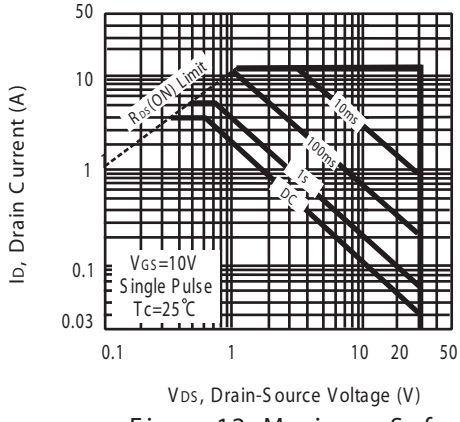
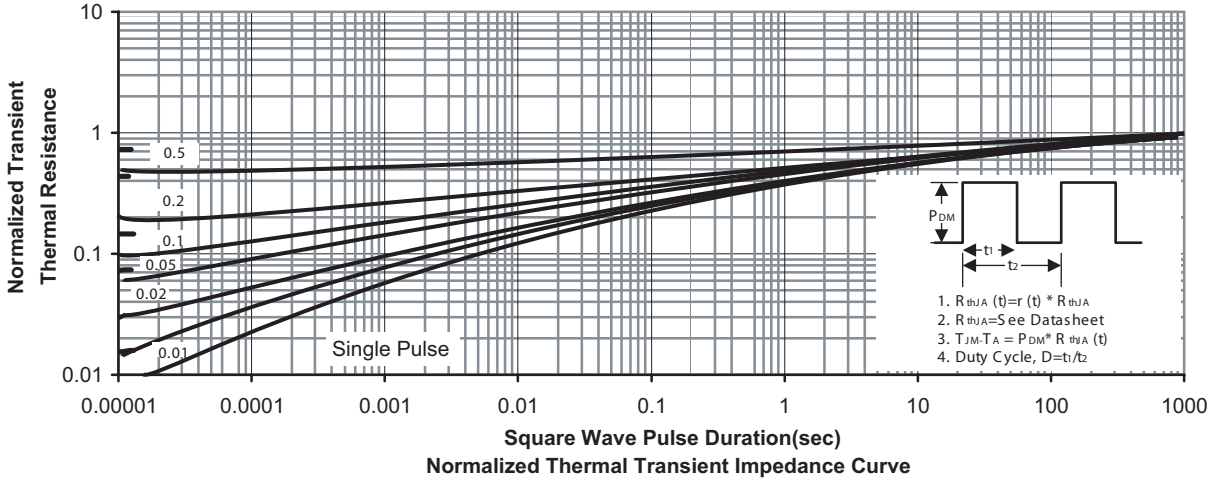


Figure 12. Maximum Safe Operating Area



P-Channel

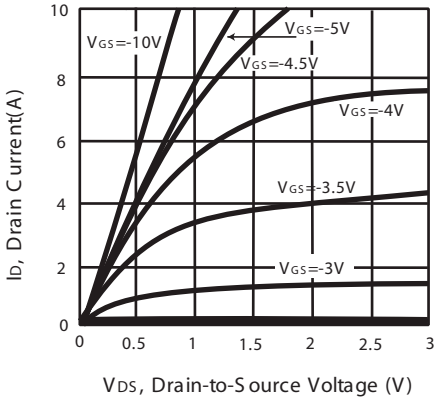


Figure 1. Output Characteristics

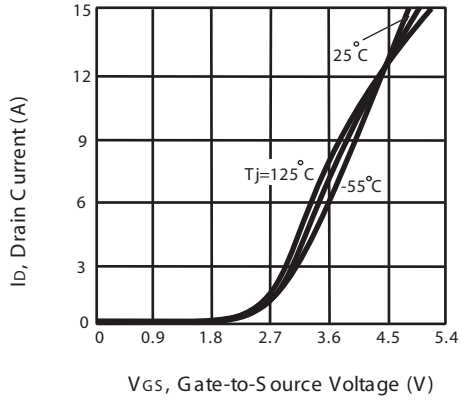


Figure 2. Transfer Characteristics

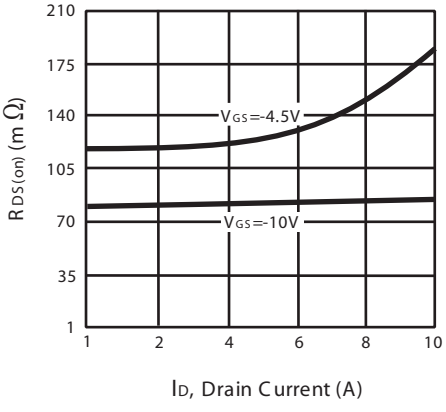


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

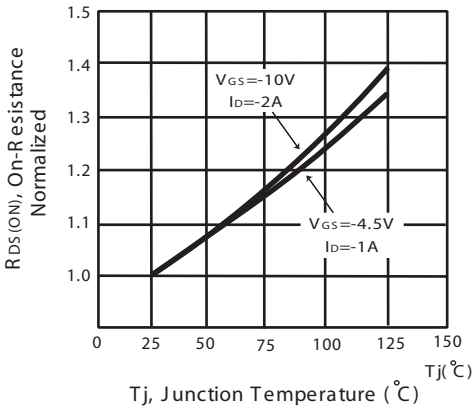


Figure 4. On-Resistance Variation with Drain Current and Temperature

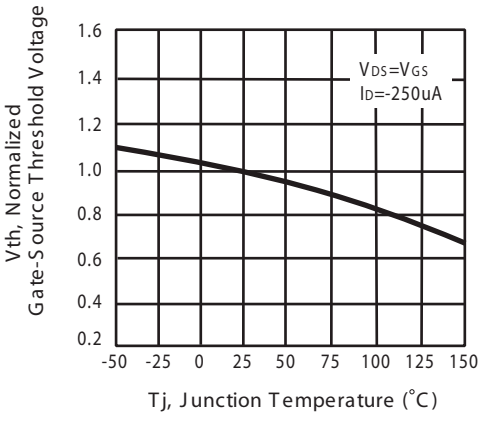


Figure 5. Gate Threshold Variation with Temperature

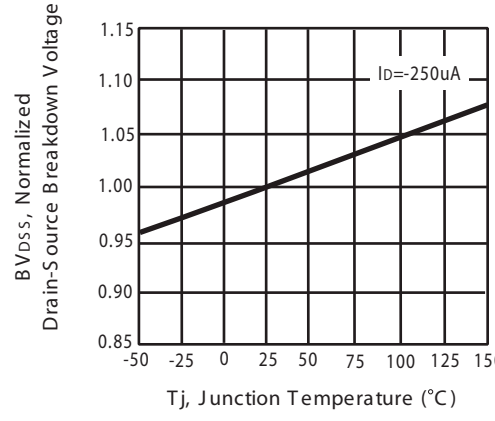


Figure 6. Breakdown Voltage Variation with Temperature

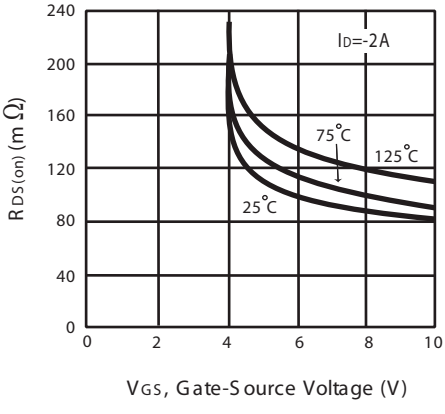


Figure 7. On-Resistance vs. Gate-Source Voltage

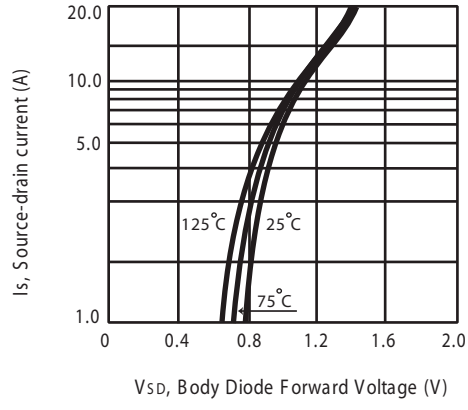


Figure 8. Body Diode Forward Voltage Variation with Source Current

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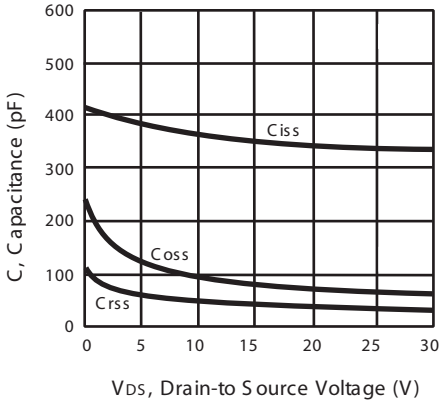

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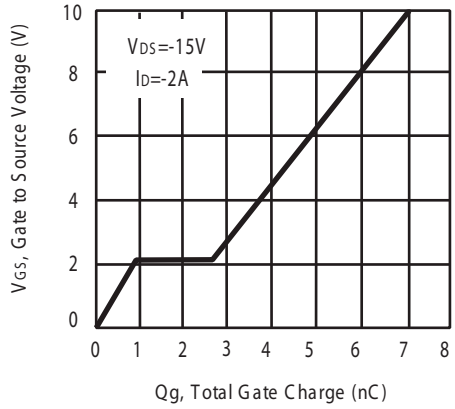

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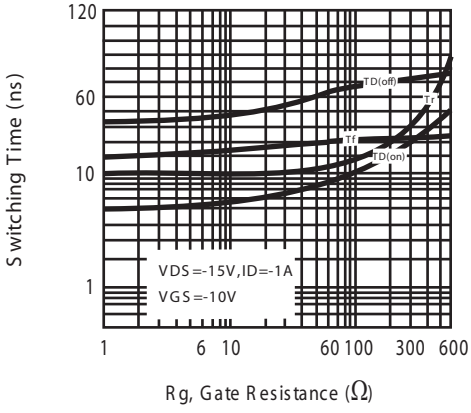

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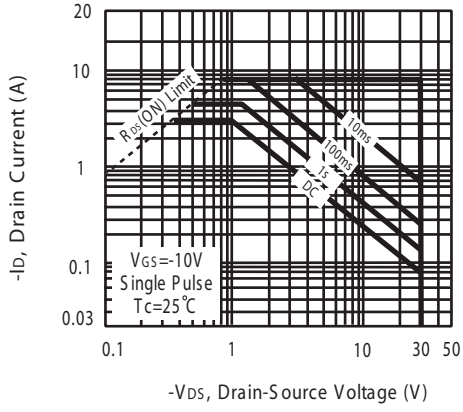
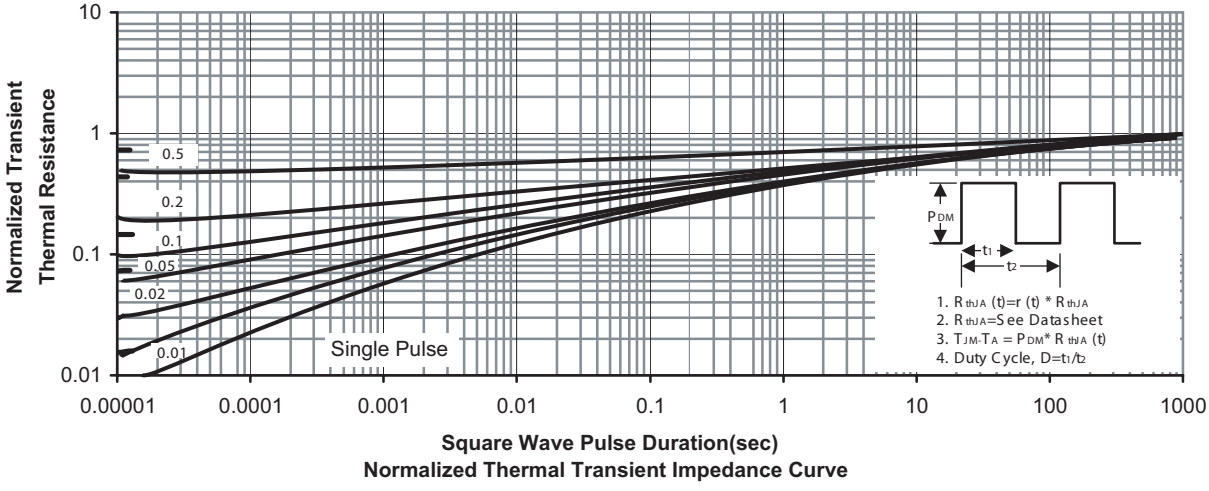


Figure 12. Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve

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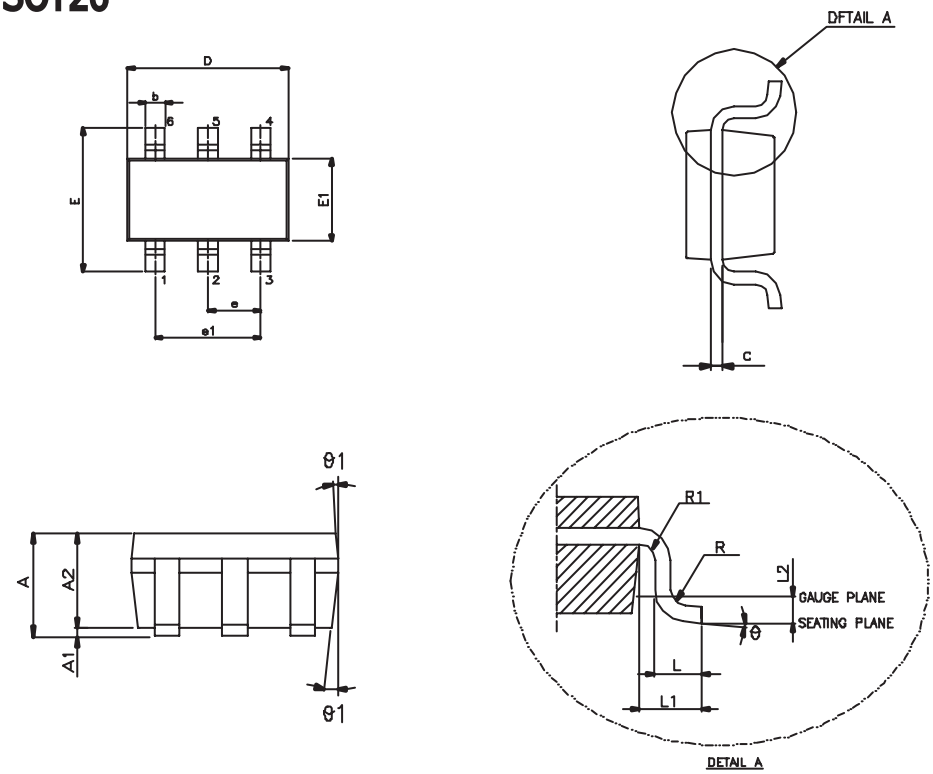
PACKAGE OUTLINE DIMENSIONS

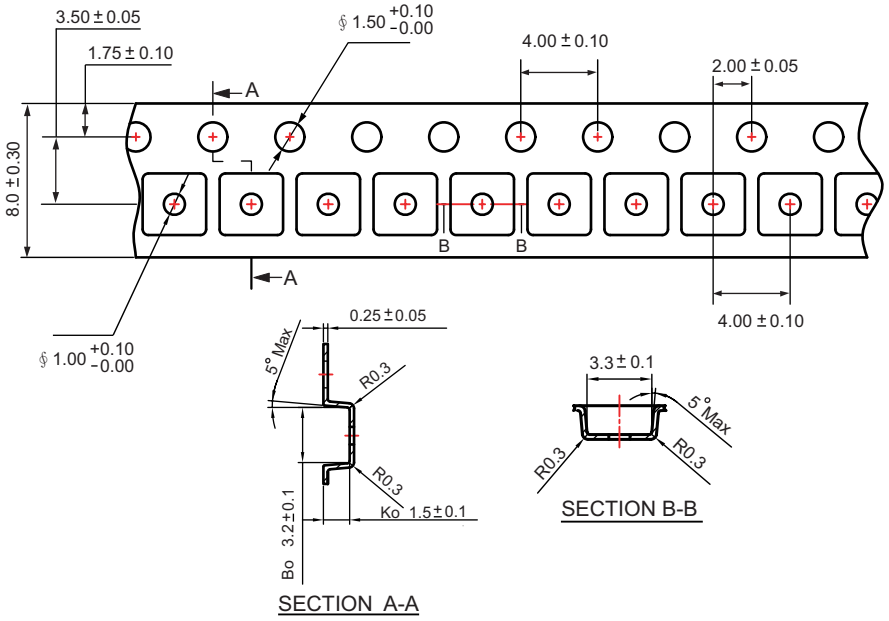
SOT26



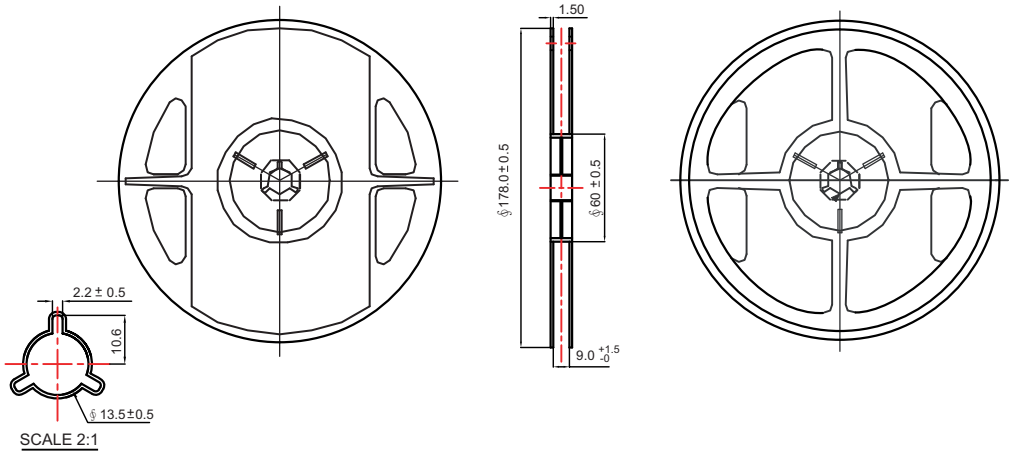
SYMBOL	MIN.	NOM.	MAX.
A	–	–	1.45
A1	–	–	0.15
A2	0.90	1.15	1.30
b	0.30	–	0.50
c	0.08	–	0.22
D		2.90 BSC.	
E		2.80 BSC.	
E1		1.60 BSC.	
e		0.95 BSC	
e1		1.90 BSC.	
L	0.30	0.45	0.60
L1		0.60 REF.	
L2		0.25 BSC.	
R	0.10	–	–
R1	0.10	–	0.25
θ	0°	4°	8°
θ1	5°	10°	15°

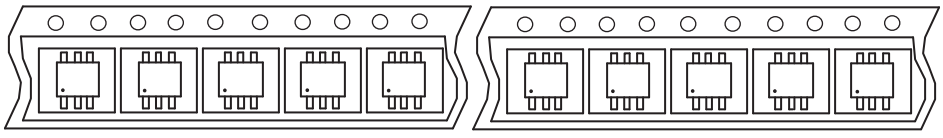
SOT 26 Tape and Reel Data

SOT 26 Carrier Tape



SOT 26 Reel





SOT 26