



STM9930A

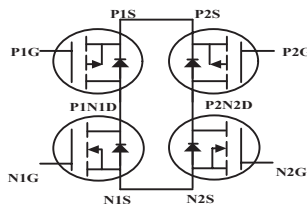
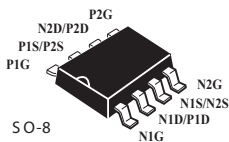
2N and 2P Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY (N-Channel)

V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
30V	6A	35 @ V _{GS} = 10V
		54 @ V _{GS} = 4.5V

PRODUCT SUMMARY (P-Channel)

V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
-30V	-5.3A	53 @ V _{GS} = -10V
		75 @ 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 @ T _a	25°C	I _D	6	-5.3	A
	70°C		4	-3.5	A
-Pulsed ^b		I _{DM}	20	-20	A
Drain-Source Diode Forward Current ^a		I _S	1.7	-1.7	A
Maximum Power Dissipation ^a	T _a = 25°C	P _D	2		W
	T _a =70°C		1.44		
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150		°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R θ JA	62.5	°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	1.5	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 5A		29	35	m ohm
		V _{GS} = 4.5V, I _D = 3A		42	54	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = 5V, V _{GS} = 4.5V	20			A
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 5A		8		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz		550		pF
Output Capacitance	C _{OSS}			130		pF
Reverse Transfer Capacitance	C _{RSS}			60		pF
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1.0MHz		2.3		ohm
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 15V I _D = 1 A V _{GS} = 10V R _{GEN} = 6 ohm		7		ns
Rise Time	t _r			8		ns
Turn-Off Delay Time	t _{D(OFF)}			15		ns
Fall Time	t _f			6		ns
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 5A, V _{GS} = 10V		13		nC
		V _{DS} = 15V, I _D = 5A, V _{GS} = 4.5V		6.6		nC
Gate-Source Charge	Q _{gs}	V _{DS} = 15V, I _D = 5 A V _{GS} = 10V		1.4		nC
Gate-Drain Charge	Q _{gd}			3.8		nC

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P-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	-1.5	-3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = -10V, I _D = -5A		44	53	m ohm
		V _{GS} = -4.5V, I _D = -3A		62	75	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = -5V, V _{GS} = -10V	-20			A
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -5A		9		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} = -25V, V _{GS} = 0V f = 1.0MHz		650		pF
Output Capacitance	C _{OSS}			170		pF
Reverse Transfer Capacitance	C _{RSS}			100		pF
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1.0MHz		2.2		ohm
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			16		ns
Turn-Off Delay Time	t _{D(OFF)}			51		ns
Fall Time	t _f			36		ns
Total Gate Charge	Q _g	V _{DS} = -15V, I _D = -5A, V _{GS} = -10V		13		nC
		V _{DS} = -15V, I _D = -5A, V _{GS} = -4.5V		6.6		nC
Gate-Source Charge	Q _{gs}	V _{DS} = -15V, I _D = -5 A V _{GS} = -10V		1.2		nC
Gate-Drain Charge	Q _{gd}			4.3		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, I _S = 1.7A	N-Ch	0.82	1.2	V
		V _{GS} = 0V, I _S = -1.7A	P-Ch	-0.8	-1.2	

Notes

a.Surface Mounted on FR4 Board, t_s≤10sec.

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

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

N-Channel

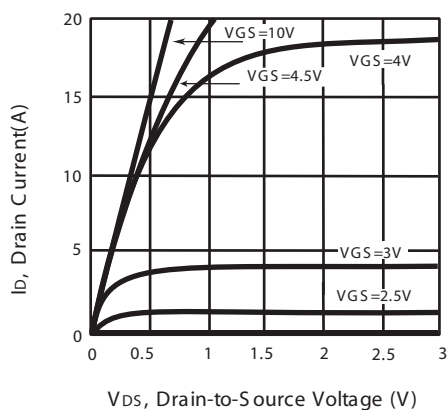


Figure 1. Output Characteristics

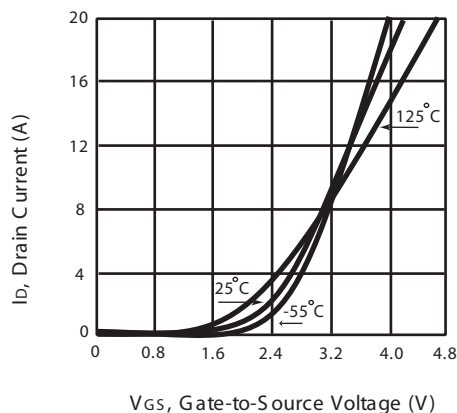


Figure 2. Transfer Characteristics

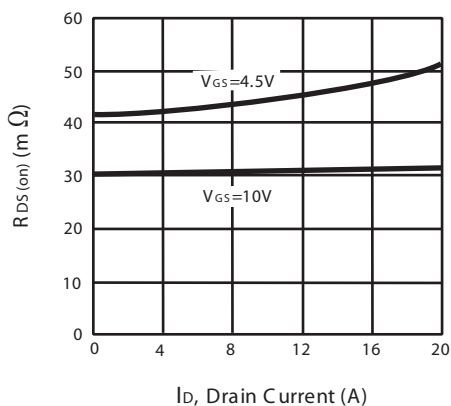


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

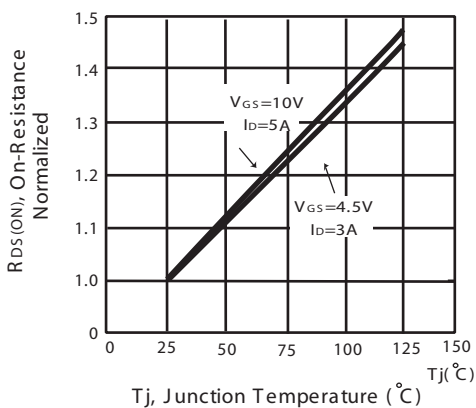


Figure 4. On-Resistance Variation with Drain Current and Temperature

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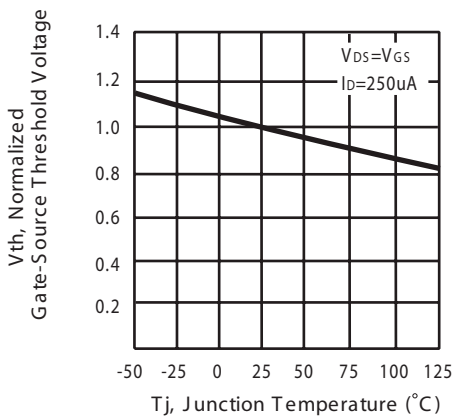


Figure 5. Gate Threshold Variation with Temperature

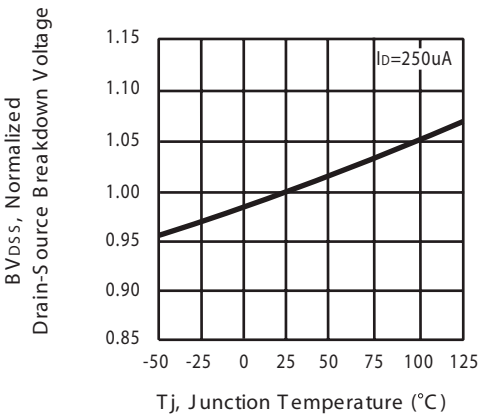


Figure 6. Breakdown Voltage Variation with Temperature

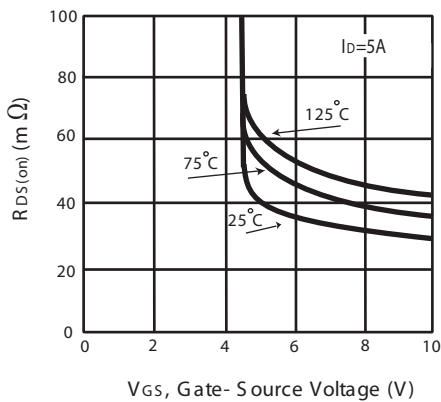


Figure 7. On-Resistance vs. Gate-Source Voltage

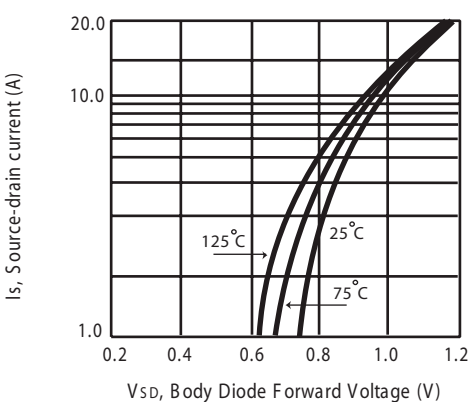
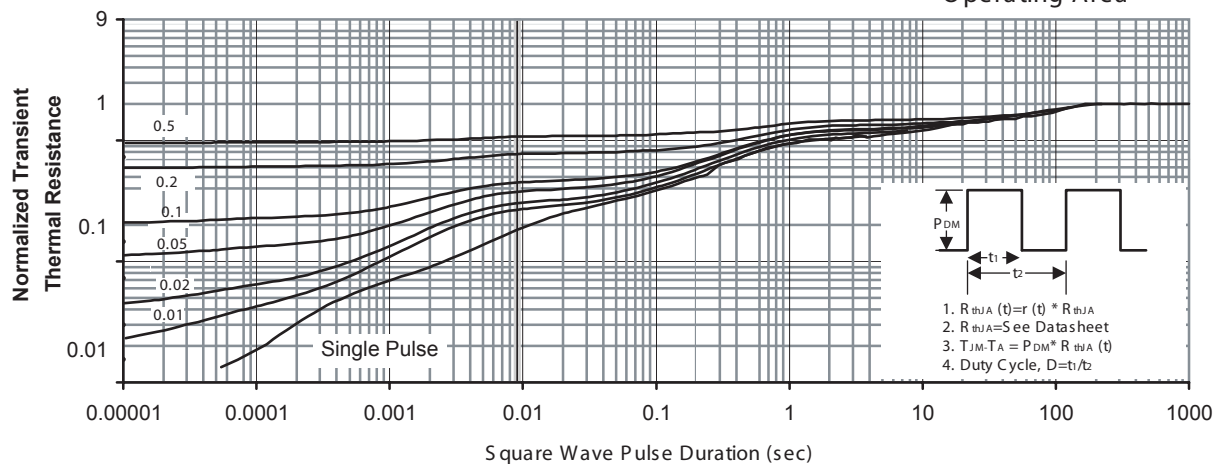
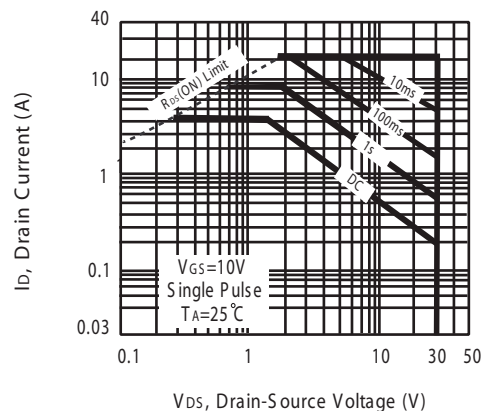
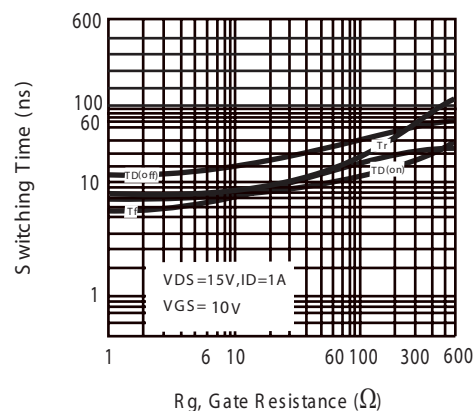
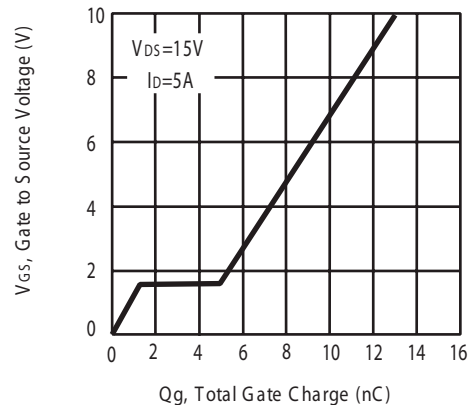
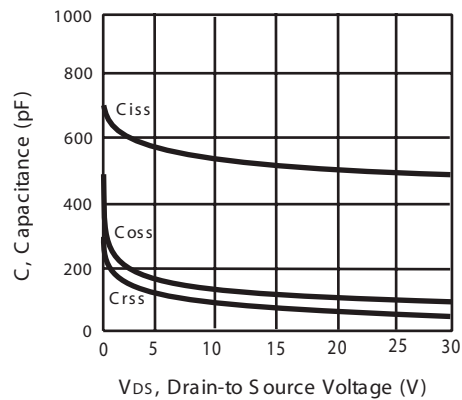


Figure 8. Body Diode Forward Voltage Variation with Source Current

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P-Channel

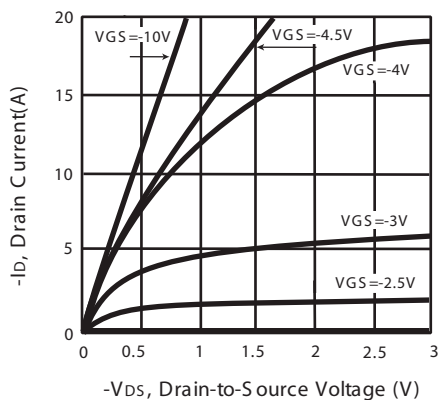


Figure 1. Output Characteristics

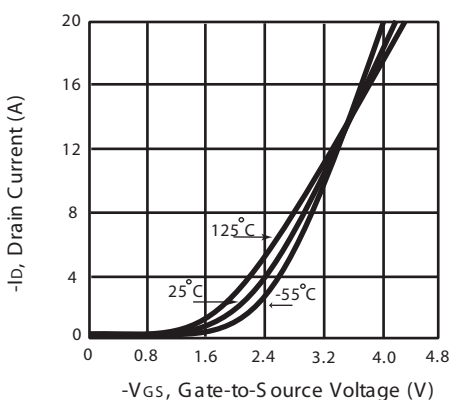


Figure 2. Transfer Characteristics

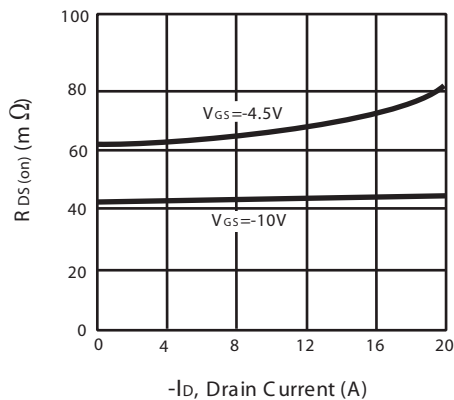


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

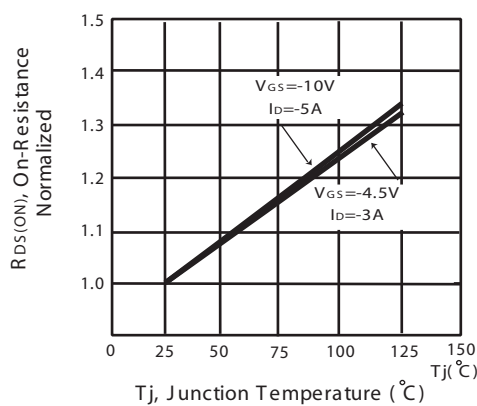


Figure 4. On-Resistance Variation with Drain Current and Temperature

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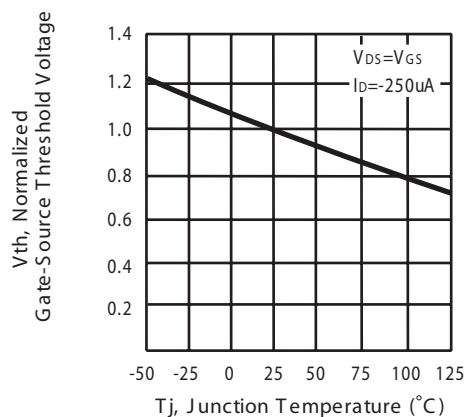


Figure 5. Gate Threshold Variation with Temperature

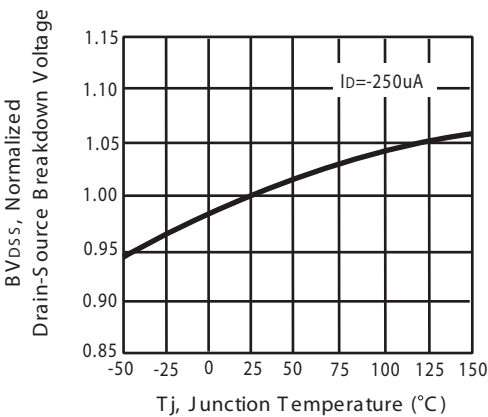


Figure 6. Breakdown Voltage Variation with Temperature

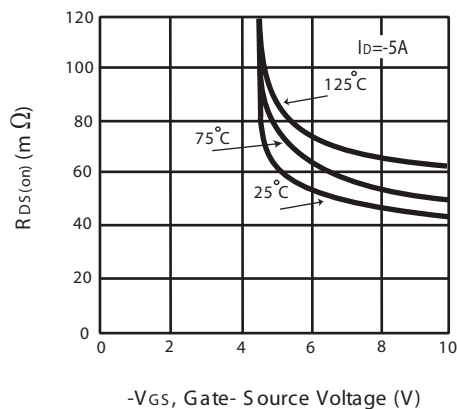


Figure 7. On-Resistance vs. Gate-Source Voltage

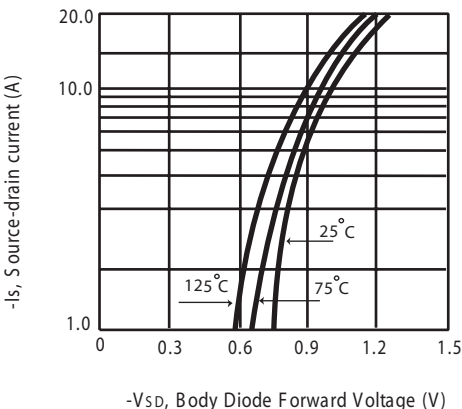


Figure 8. Body Diode Forward Voltage Variation with Source Current

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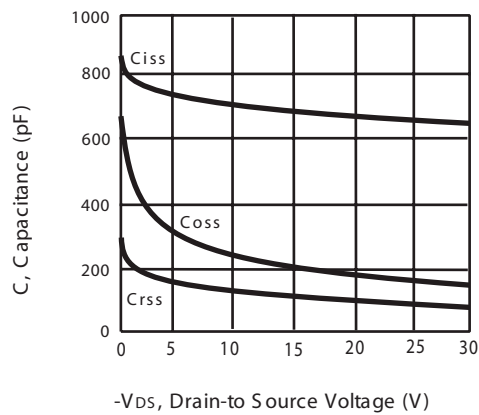


Figure 9. Capacitance

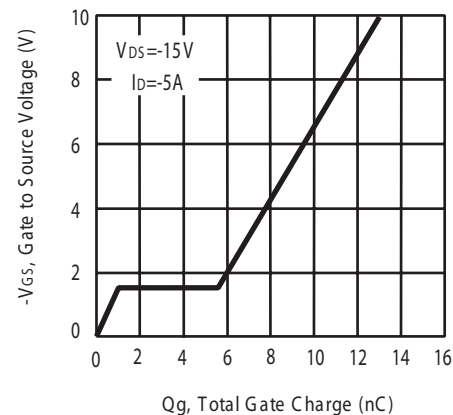


Figure 10. Gate Charge

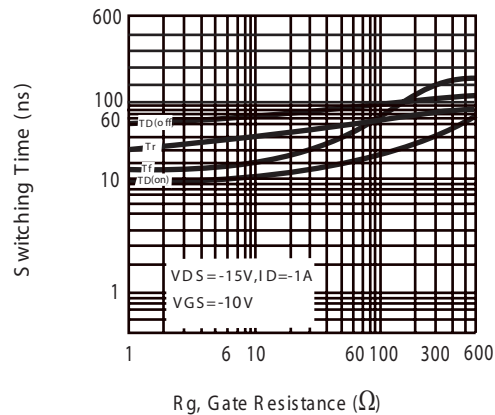


Figure 11. switching characteristics

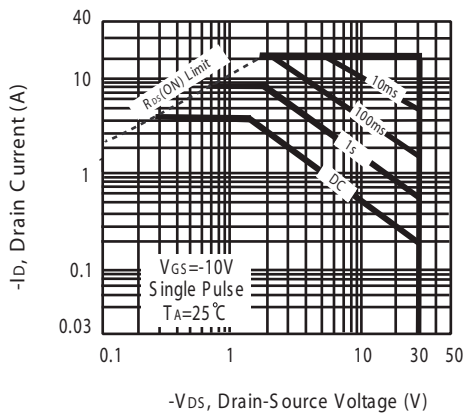


Figure 12. Maximum Safe Operating Area

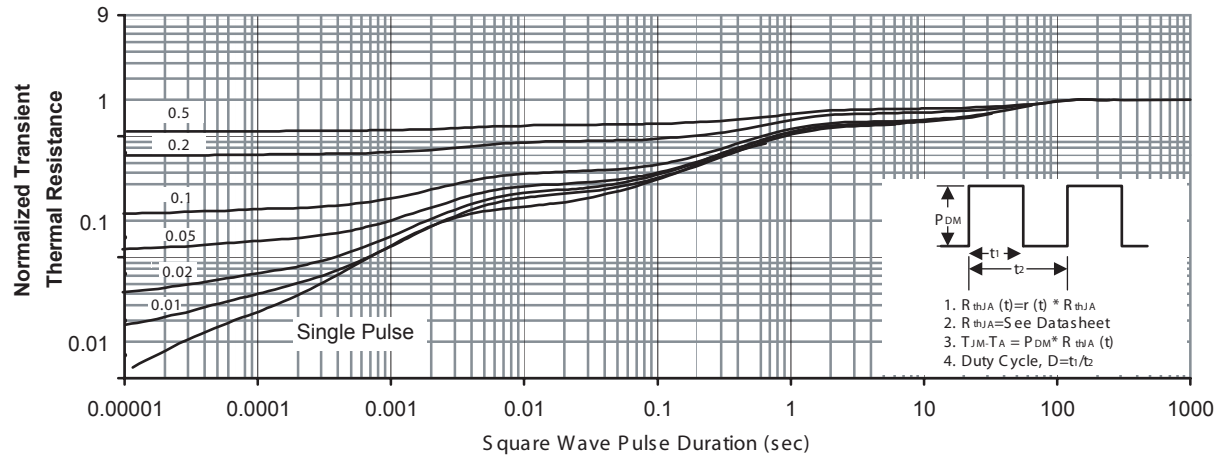
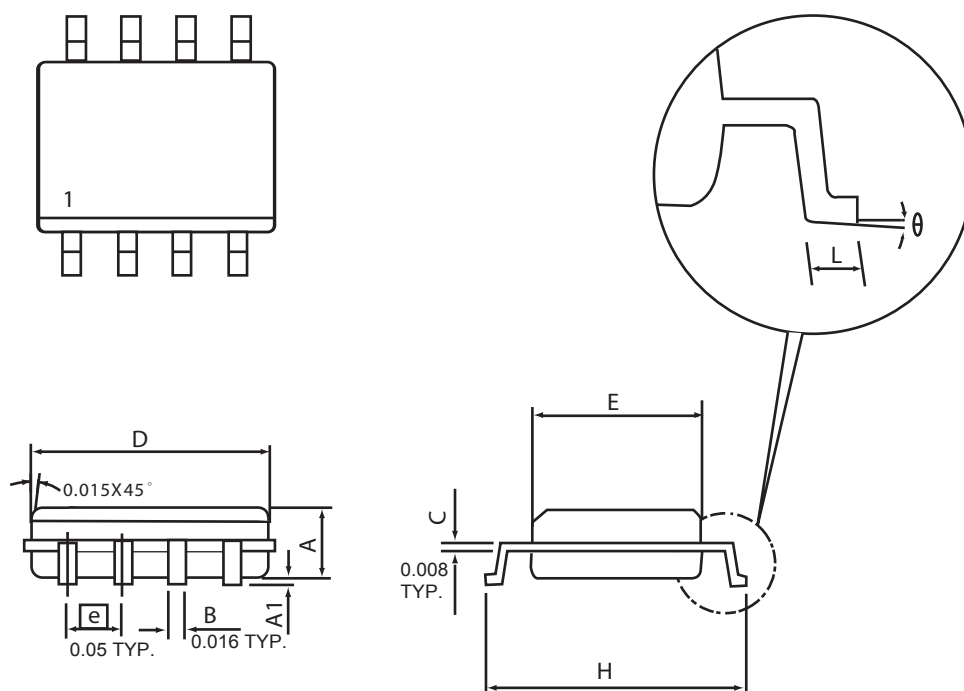


Figure 13. Normalized Thermal Transient Impedance Curve

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PACKAGE OUTLINE DIMENSIONS

SO-8

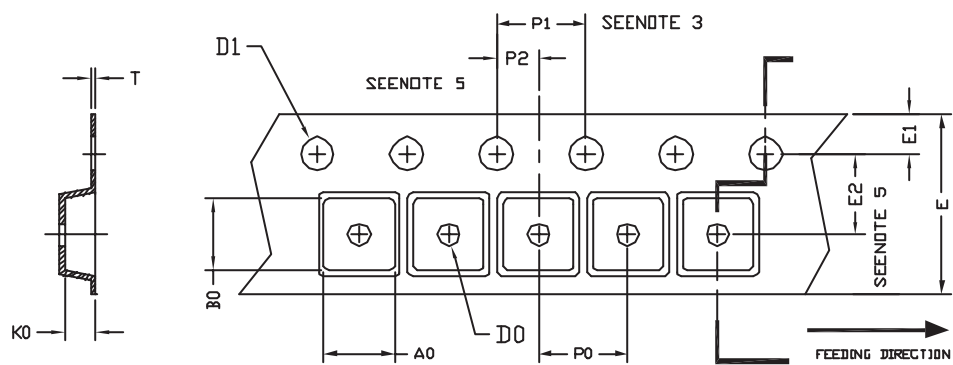


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°

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SO-8 Tape and Reel Data

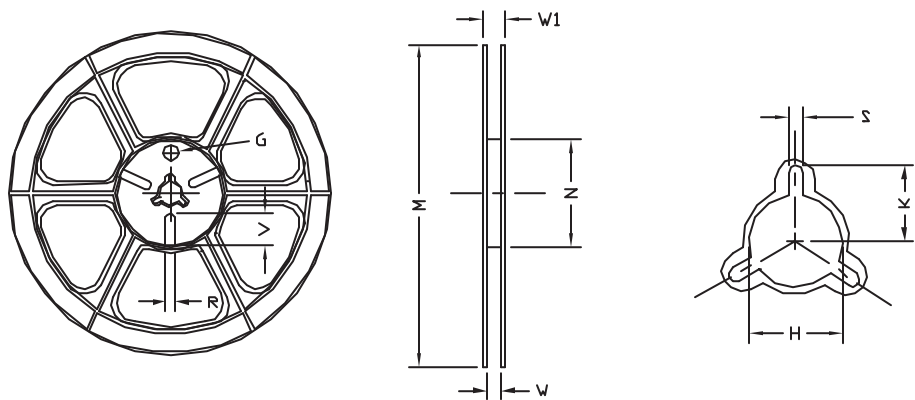
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	$\phi 1.5$ (MIN)	$\phi 1.5$ + 0.1 - 0.0	12.0 ± 0.3	1.75	5.5 ± 0.05	8.0	4.0	2.0 ± 0.05	0.3 ± 0.05

SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	$\phi 330$	330 ± 1	62 ± 1.5	12.4 + 0.2	16.8 - 0.4	$\phi 12.75$ + 0.15	---	2.0 ± 0.15	---	---	---