SamHop Microelectronics Corp.

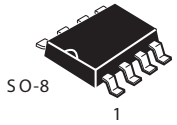
STM8455

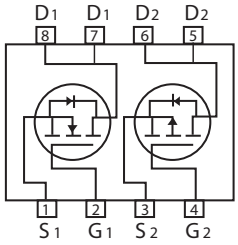
Aug.16,2006

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

PRODUCT SUMMARY (N-Channel)		
V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω) Max
40V	6A	29 @ V_{GS} = 10V
		40 @ V_{GS} = 4.5V

PRODUCT SUMMARY (P-Channel)		
V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω) Max
-40V	-5A	42 @ V_{GS} = -10V
		62 @ 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}	40	-40	V
Gate-Source Voltage		V_{GS}	±20	± 20	V
Drain Current-Continuous [a] @ Ta	25°C	I_D	6	-5	A
	70°C		5.1	-4.2	A
-Pulsed [b]		I_{DM}	28	-20	A
Drain-Source Diode Forward Current [a]		I_S	1.7	-1.7	A
Maximum Power Dissipation [a]	Ta= 25°C	P_D	2		W
	Ta=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]	$R_{\theta JA}$	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	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V, 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	1.0	1.8	3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5A		23	29	m ohm
		V_{GS}=4.5V, I_D=4A		30	40	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	20			A
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 5A		15		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=20V, V_{GS} = 0V f=1.0MHz		890		pF
Output Capacitance	C_{OSS}			115		pF
Reverse Transfer Capacitance	C_{RSS}			65		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 20V I_D = 5 A V_{GS} = 10V R_{GEN} = 3.3 ohm		16		ns
Rise Time	t_r			12		ns
Turn-Off Delay Time	$t_{D(OFF)}$			30		ns
Fall Time	t_f			8		ns
Total Gate Charge	Q_g	V_{DS}=24V, I_D=5A, V_{GS}=10V		17		nC
		V_{DS}=24V, I_D=5A, V_{GS}=4.5V		8.5		nC
Gate-Source Charge	Q_{gs}	V_{DS}=24V, I_D = 5 A V_{GS}=4.5V		2.2		nC
Gate-Drain Charge	Q_{gd}			4.3		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	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-32V, 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	-1.0	-1.8	-3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4A		35	42	m ohm
		V_{GS}=-4.5V, I_D=-3A		50	62	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=-5V, V_{GS}=-10V	16			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-4A		10		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=-20V, V_{GS}=0V f=1.0MHz		900		pF
Output Capacitance	C_{OSS}			140		pF
Reverse Transfer Capacitance	C_{RSS}			85		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_D=-20V I_D=-4A V_{GEN}=-10V R_{GEN}=3.3 ohm		12		ns
Rise Time	t_r			16		ns
Turn-Off Delay Time	$t_{D(OFF)}$			55		ns
Fall Time	t_f			30		ns
Total Gate Charge	Q_g	V_{DS}=-24V,I_D=-4A,V_{GS}=-10V		17.6		nC
		V_{DS}=-24V,I_D=-4A,V_{GS}=-4.5V		8.8		nC
Gate-Source Charge	Q_{gs}	V_{DS}=-24V, I_D=-4A V_{GS}=-4.5V		1.8		nC
Gate-Drain Charge	Q_{gd}			5		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 =1.7A	N-Ch		0.8	1.3	V
		V_{GS} = 0V, Is =-1.7A	P-Ch		-0.77	-1.3	

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

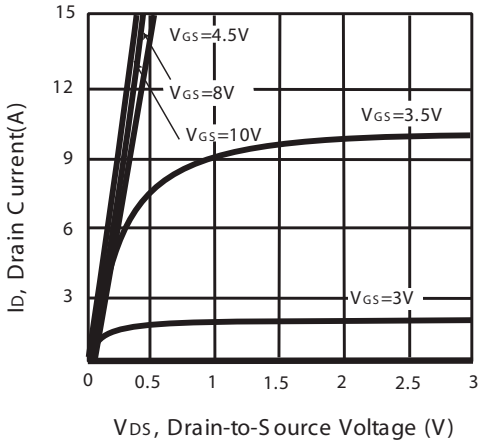

Figure 1. Output Characteristics

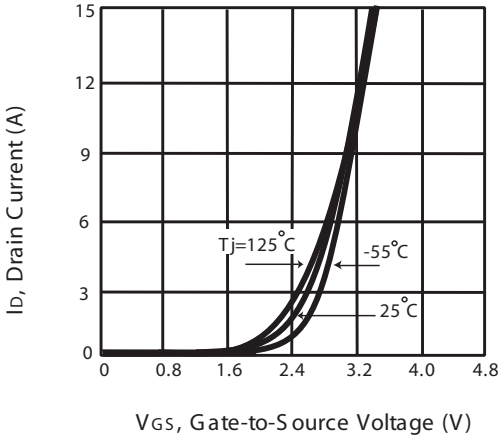

Figure 2. Transfer Characteristics

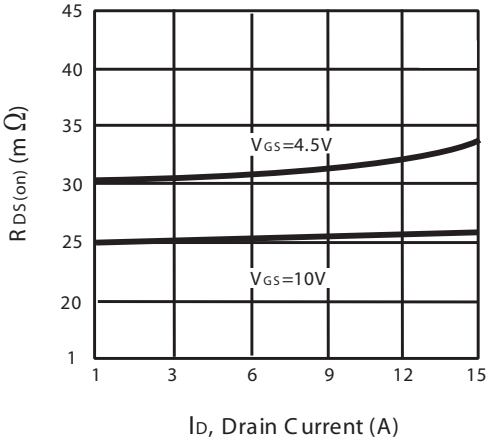

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

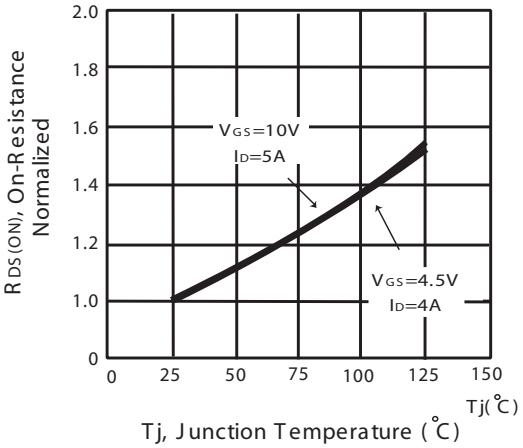

Figure 4. On-Resistance Variation with Drain Current and Temperature

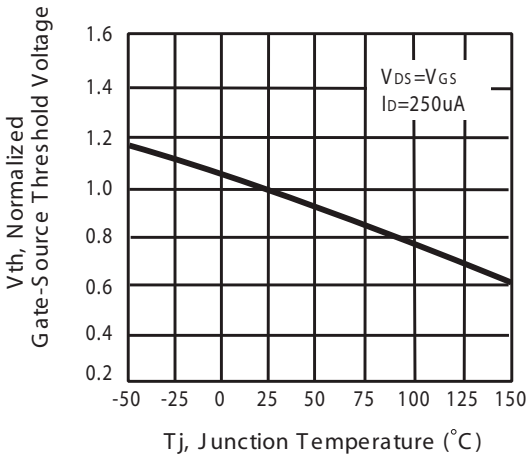

Figure 5. Gate Threshold Variation with Temperature

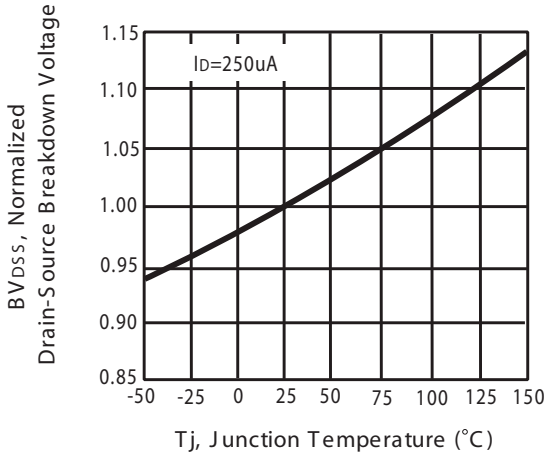

Figure 6. Breakdown Voltage Variation with Temperature

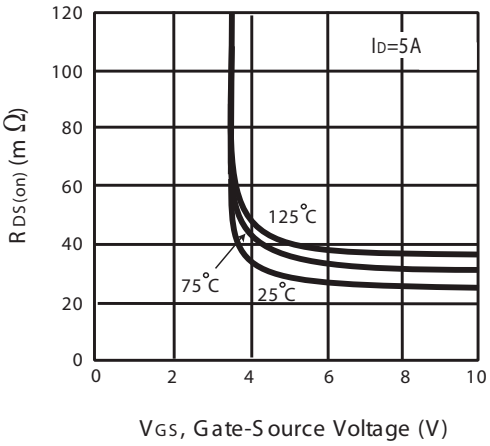

Figure 7. On-Resistance vs. Gate-Source Voltage

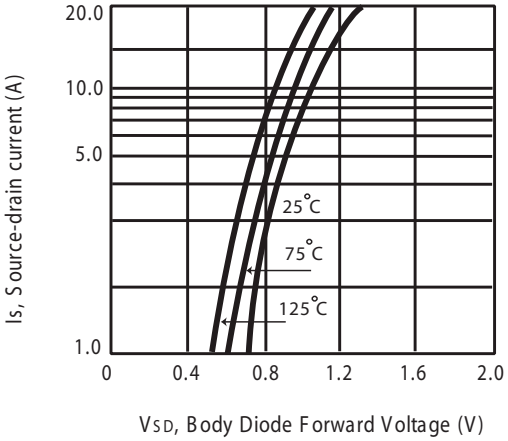

Figure 8. Body Diode Forward Voltage Variation with Source Current

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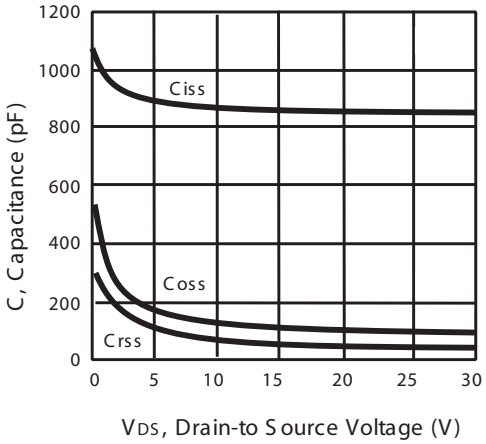


Figure 9. Capacitance

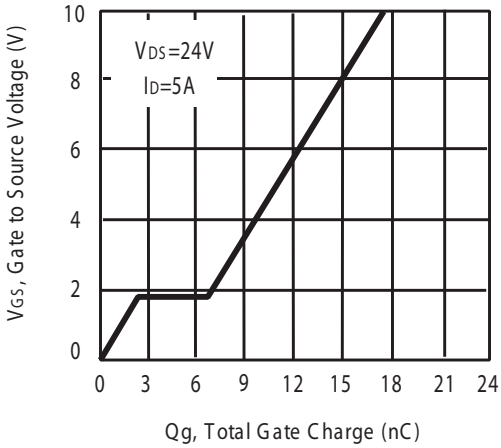


Figure 10. Gate Charge

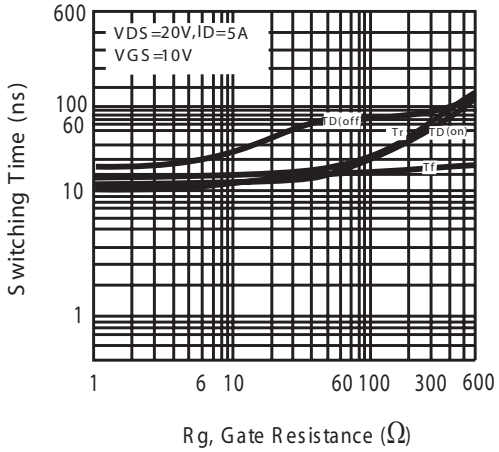


Figure 11.switching characteristics

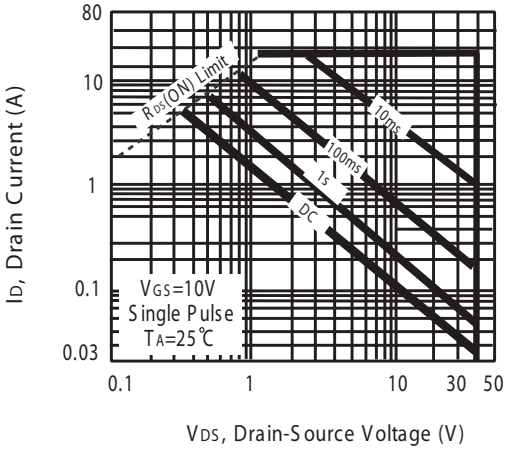
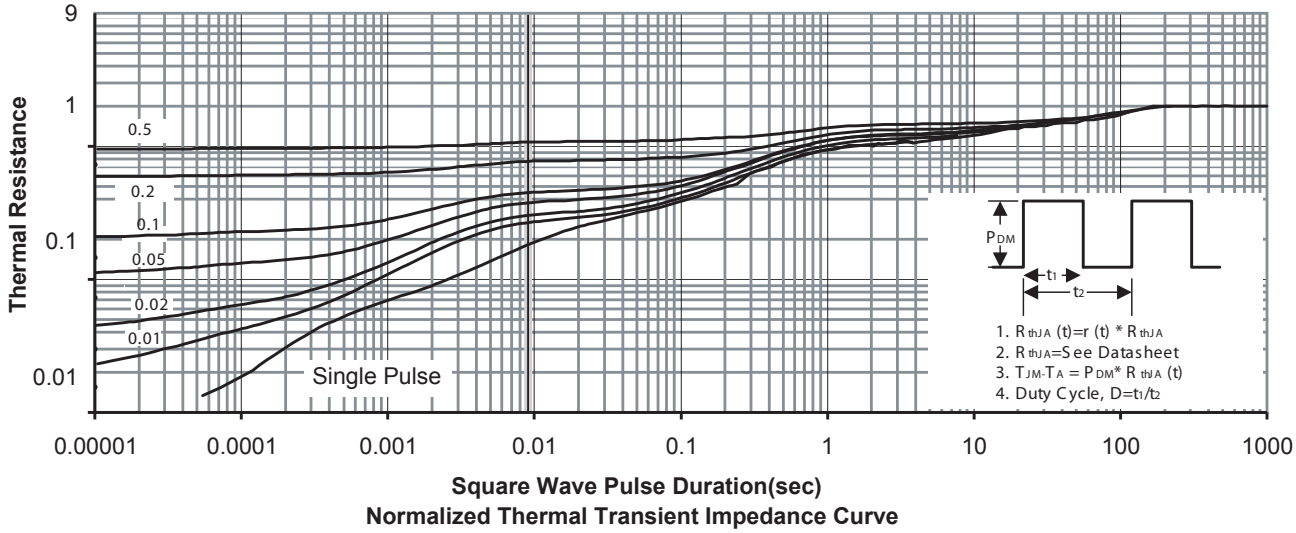


Figure 12. Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve

P-Channel

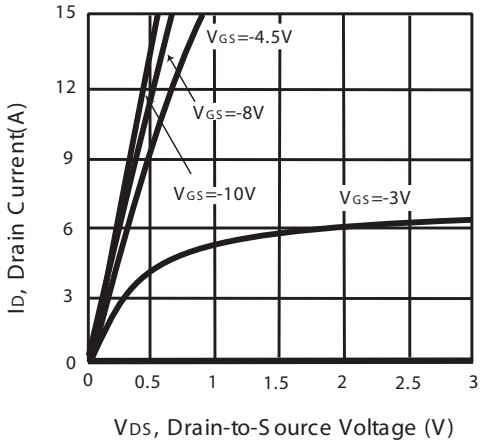
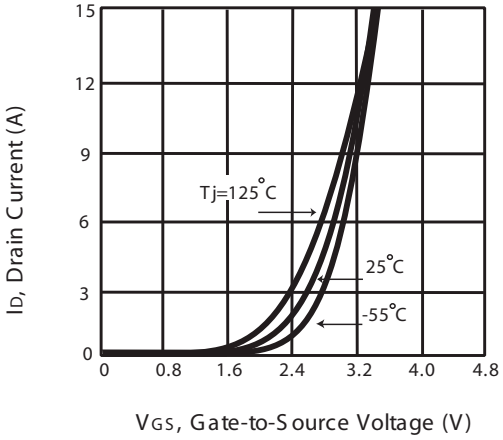


Figure 1. Output Characteristics



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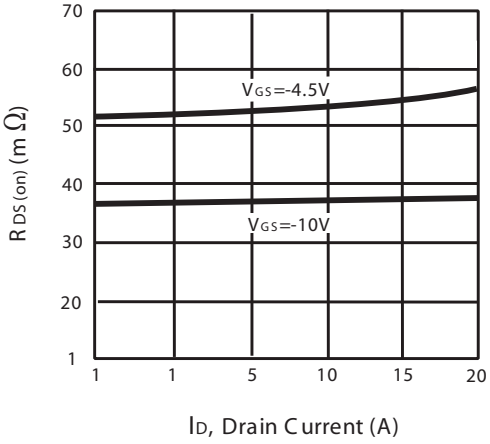

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

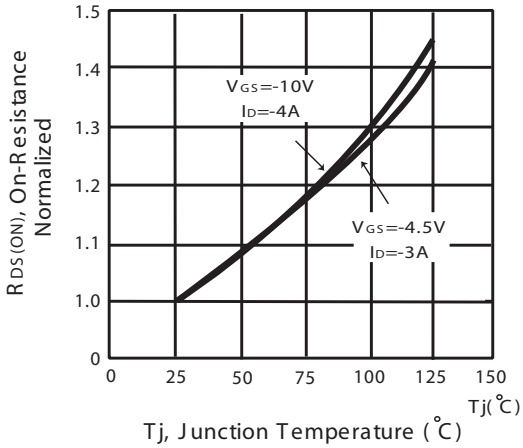

Figure 4. On-Resistance Variation with Drain Current and Temperature

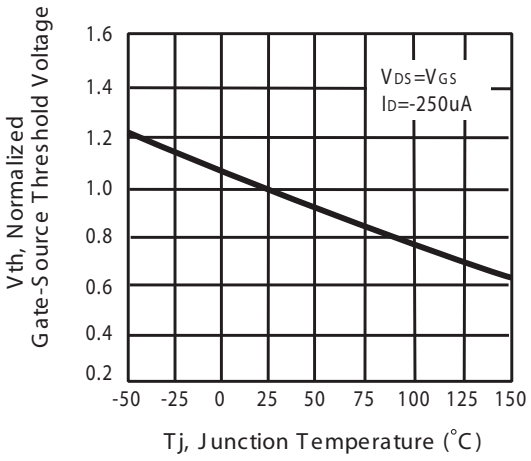

Figure 5. Gate Threshold Variation with Temperature

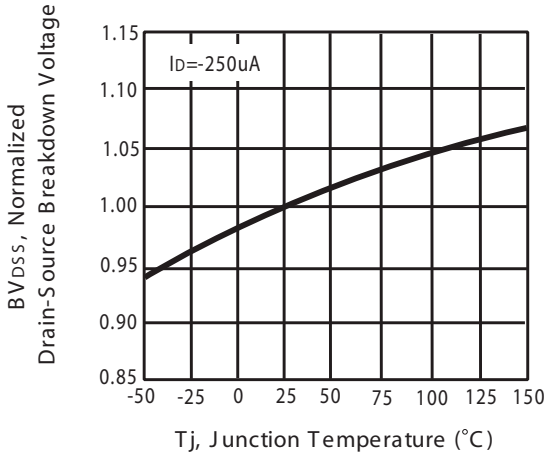

Figure 6. Breakdown Voltage Variation with Temperature

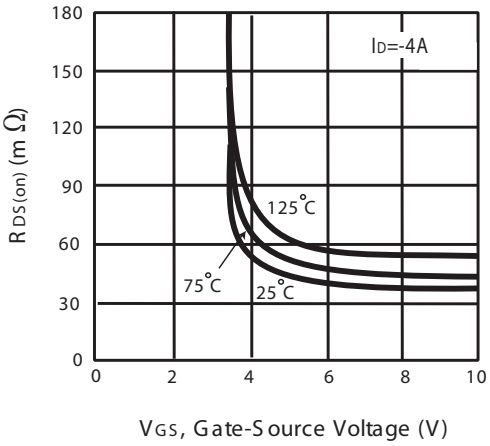

Figure 7. On-Resistance vs. Gate-Source Voltage

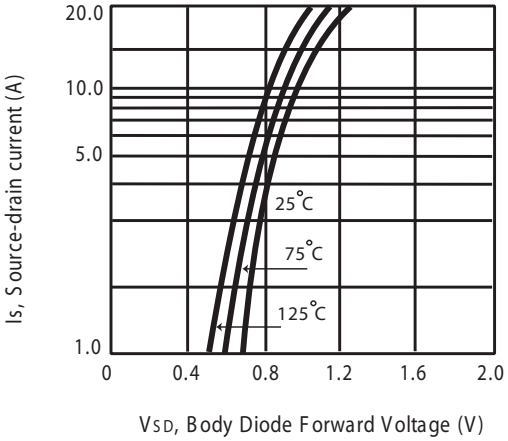

Figure 8. Body Diode Forward Voltage Variation with Source Current

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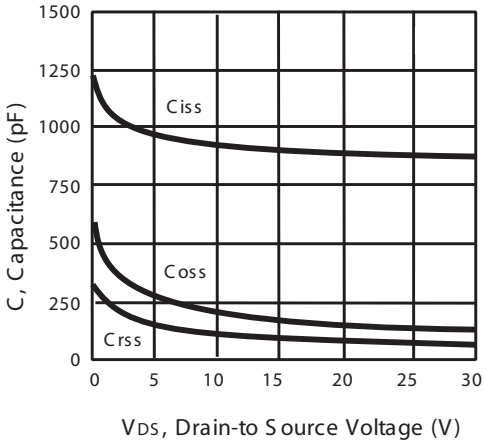

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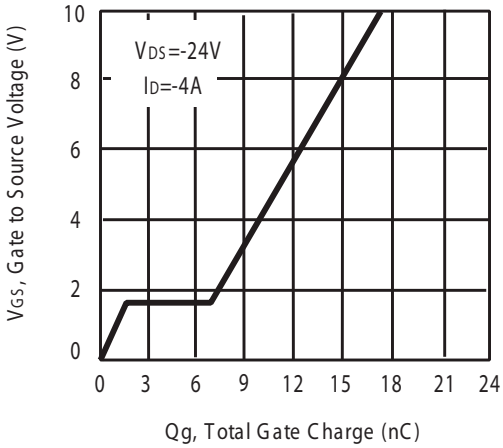

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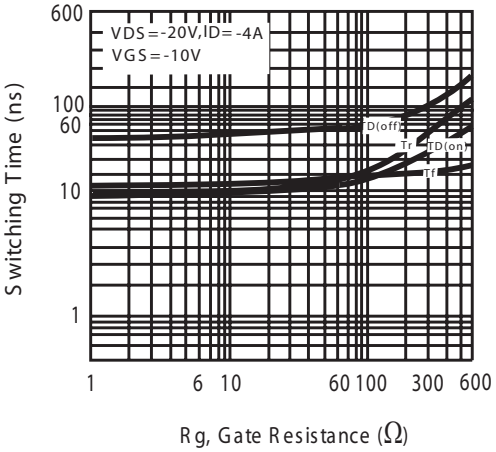


Figure 11.switching characteristics

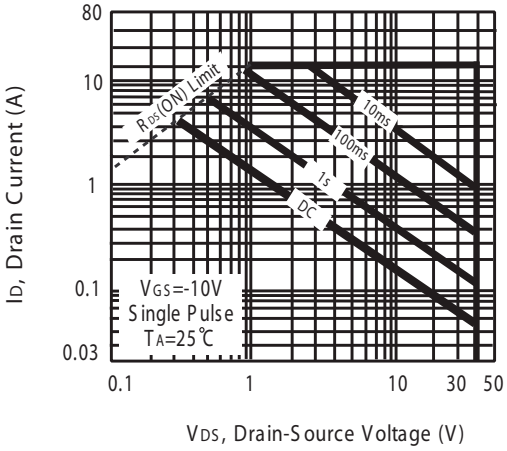
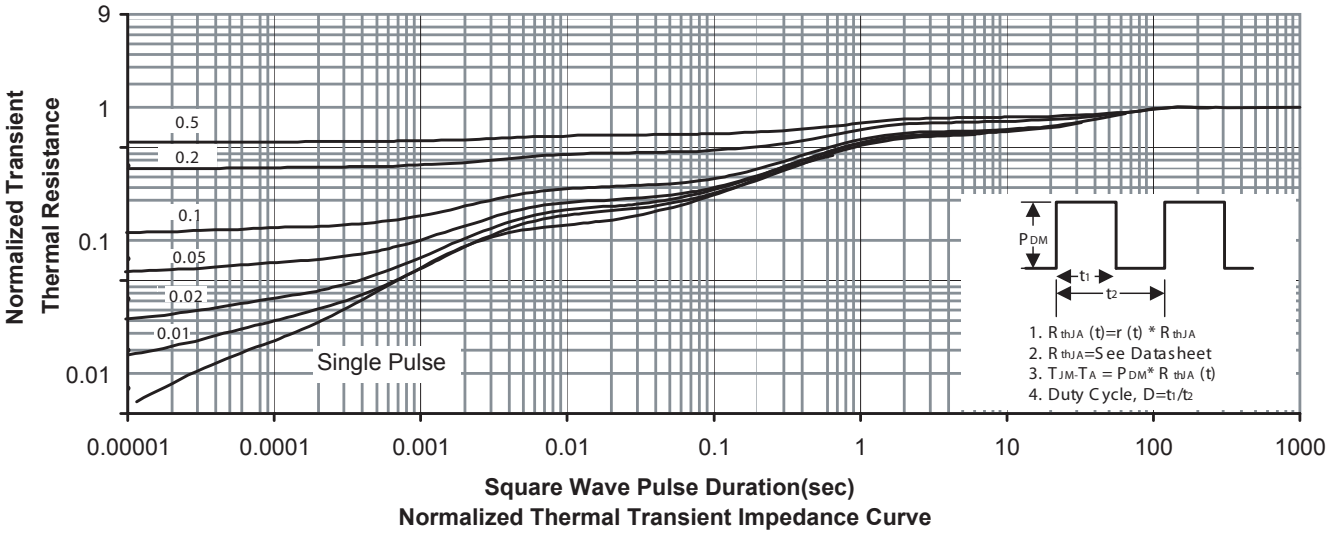


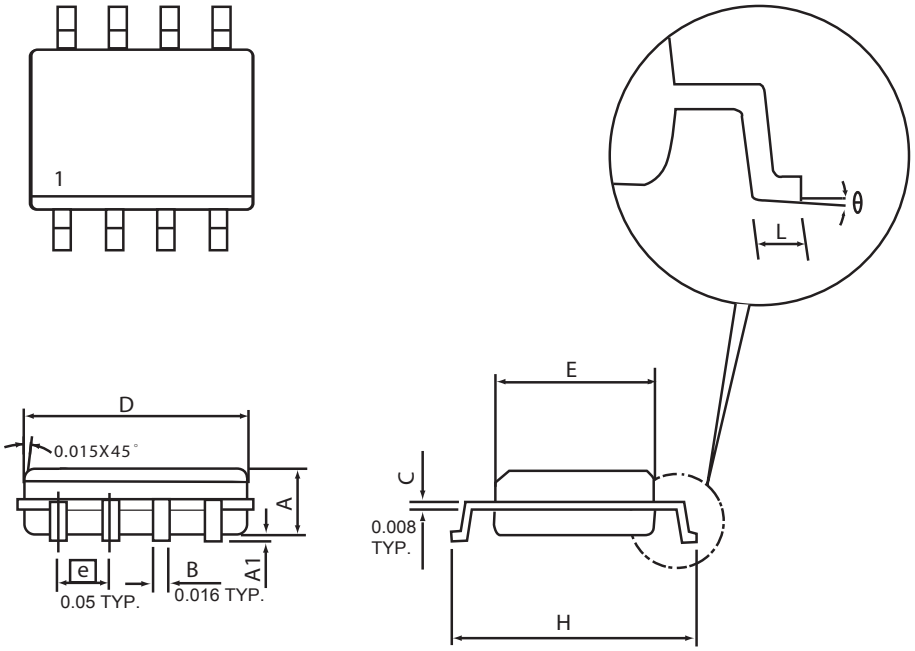
Figure 12. Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

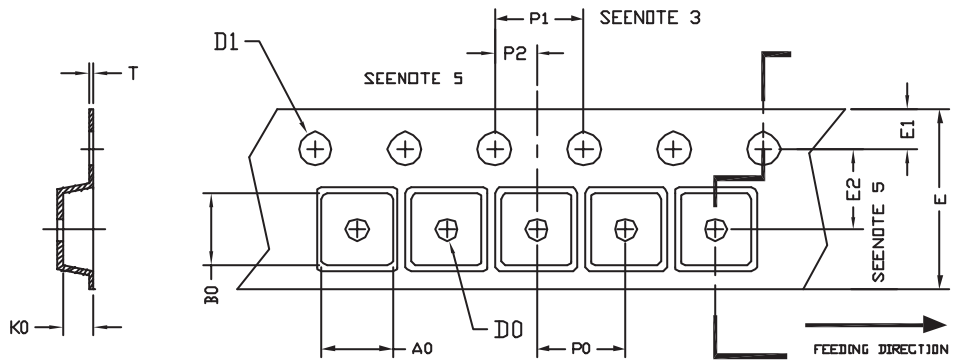
SO-8



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°

SO-8 Tape and Reel Data

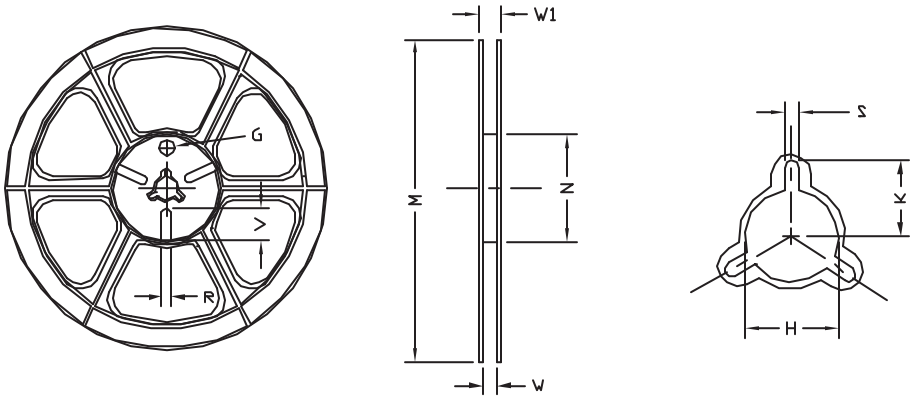
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	ϕ1.5 (MIN)	ϕ1.5 + 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	ϕ330	330 ± 1	62 ±1.5	12.4 + 0.2	16.8 - 0.4	ϕ12.75 + 0.15	---	2.0 ±0.15	---	---	---