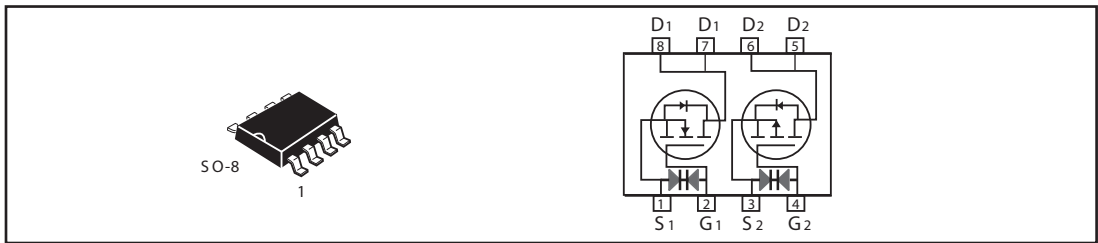




Dual Enhancement Mode Field Effect Transistor (N and P Channel)

PRODUCT SUMMARY (N-Channel)		
V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
30V	7A	23 @ V _{GS} = 10V
		30 @ V _{GS} = 4.5V

PRODUCT SUMMARY (P-Channel)		
V _{DSS}	I _D	R _{DS(ON)} (m Ω) Max
-30V	-6A	35 @ V _{GS} = -10V
		52 @ 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 _J =25 °C -Pulsed ^b	I _D	7	-6	A
	I _{DM}	28	-24	A
Drain-Source Diode Forward Current ^a	I _S	1.7	-1.7	A
Maximum Power Dissipation ^a	P _D	2.0		W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150		°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	62.5	°C/W
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N-Channel ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 10	μA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.9	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=7A$		17	23	m ohm
		$V_{GS}=4.5V, I_D=5A$		23	30	m ohm
On-State Drain Current	$I_{D(ON)}$	$V_{DS}=15V, V_{GS}=10V$	20			A
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=7A$		14		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS}=15V, V_{GS}=0V$ $f=1.0MHz$		680		pF
Output Capacitance	C_{OSS}			190		pF
Reverse Transfer Capacitance	C_{RSS}			115		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=15V,$ $I_D=7A,$ $R_L=2.1\text{ ohm},$ $V_{GS}=10V,$ $R_{GEN}=6\text{ ohm}$		12		ns
Rise Time	t_r			17.5		ns
Turn-Off Delay Time	$t_{D(OFF)}$			41		ns
Fall Time	t_f			15		ns
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=7A, V_{GS}=10V$		11		nC
		$V_{DS}=15V, I_D=7A, V_{GS}=4.5V$		5.5		nC
Gate-Source Charge	Q_{gs}	$V_{DS}=15V, I_D=7A,$ $V_{GS}=10V$		1.7		nC
Gate-Drain Charge	Q_{gd}			3.3		nC

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P-Channel ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 10	μA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.9	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5A$		29	35	m ohm
		$V_{GS}=-4.5V, I_D=-4A$		44	52	m ohm
On-State Drain Current	$I_{D(ON)}$	$V_{DS}=-15V, V_{GS}=-10V$	-20			A
Forward Transconductance	g_{FS}	$V_{DS}=-15V, I_D=-5A$		8.5		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS}=-15V, V_{GS}=0V$ $f=1.0MHz$		870		pF
Output Capacitance	C_{OSS}			225		pF
Reverse Transfer Capacitance	C_{RSS}			125		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_D=-15V,$ $R_L=15\text{ ohm},$ $I_D=-1A,$ $V_{GEN}=-10V,$ $R_{GEN}=6\text{ ohm}$		12		ns
Rise Time	t_r			18		ns
Turn-Off Delay Time	$t_{D(OFF)}$			70		ns
Fall Time	t_f			40		ns
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-5A, V_{GS}=-10V$		15		nC
		$V_{DS}=-15V, I_D=-5A, V_{GS}=-4.5V$		7.5		nC
Gate-Source Charge	Q_{gs}	$V_{DS}=-15V, I_D=-5A,$ $V_{GS}=-10V$		1.7		nC
Gate-Drain Charge	Q_{gd}			4.5		nC

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ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_s = 1.7\text{A}$	N-Ch	0.8	1.2	V
		$V_{GS} = 0\text{V}, I_s = -1.7\text{A}$	P-Ch	-0.8	-1.2	

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
 - b. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.
 - c. Guaranteed by design, not subject to production testing.
- N-Channel

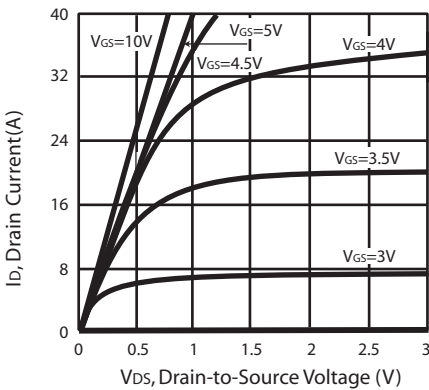


Figure 1. Output Characteristics

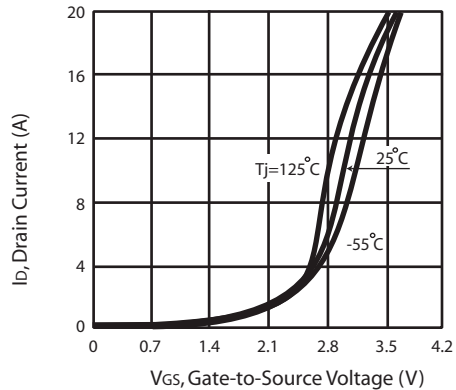


Figure 2. Transfer Characteristics

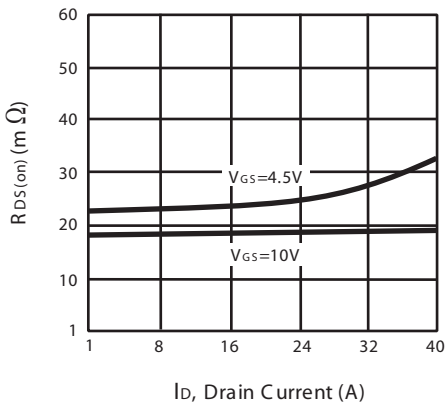


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

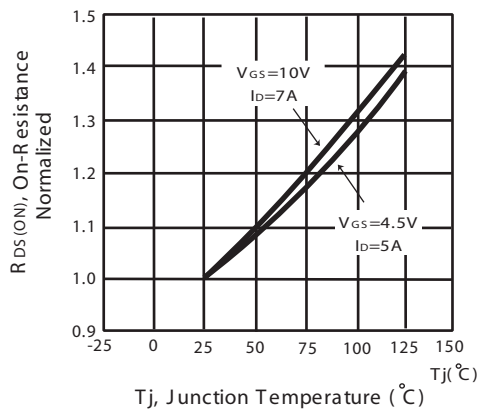


Figure 4. On-Resistance Variation with Drain Current and Temperature

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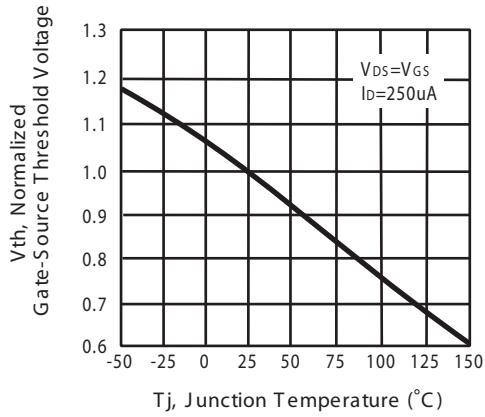


Figure 5. Gate Threshold Variation with Temperature

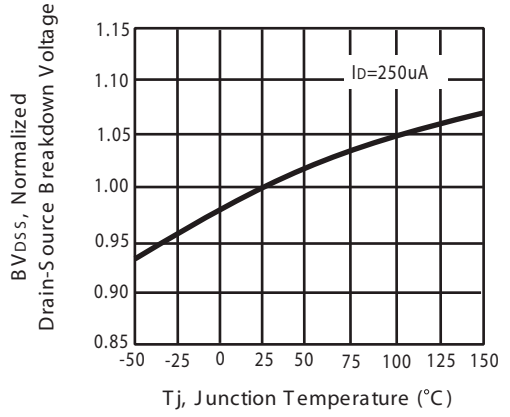


Figure 6. Breakdown Voltage Variation with Temperature

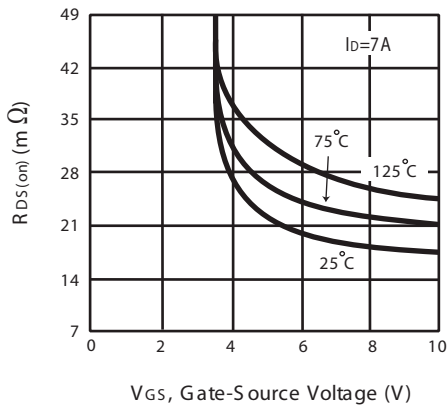


Figure 7. On-Resistance vs. Gate-Source Voltage

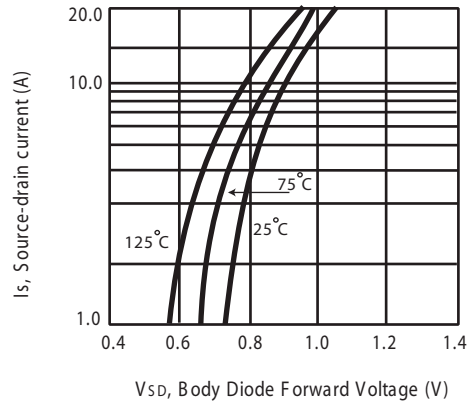
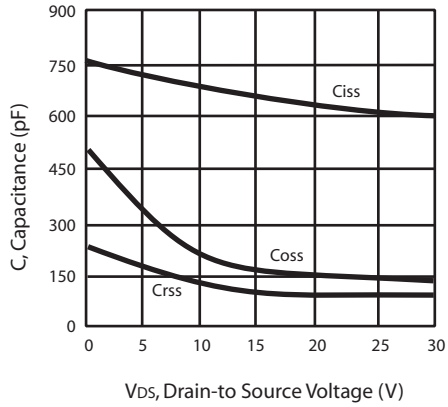


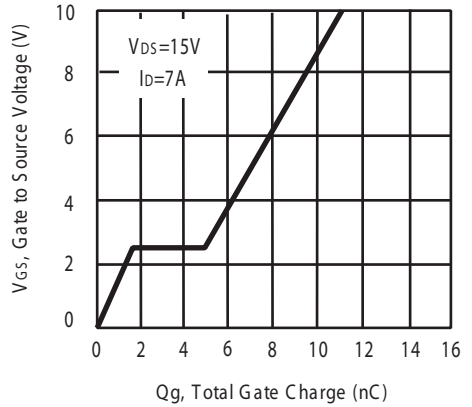
Figure 8. Body Diode Forward Voltage Variation with Source Current

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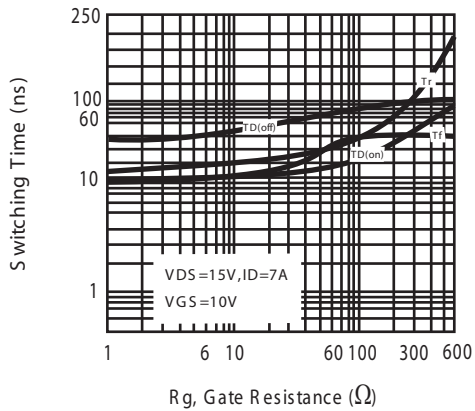
V_{DS} , Drain-to Source Voltage (V)

Figure 8. Capacitance



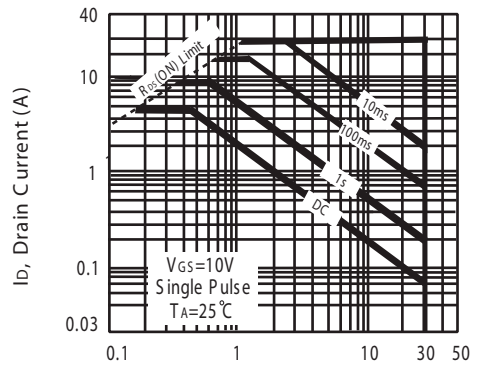
Q_g , Total Gate Charge (nC)

Figure 9. Gate Charge



R_g , Gate Resistance (Ω)

Figure 11. switching characteristics



V_{DS} , Drain-Source Voltage (V)

Figure 10. Maximum Safe Operating Area

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P-Channel

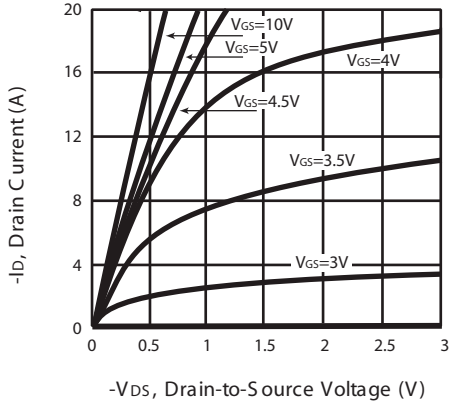


Figure 1. Output Characteristics

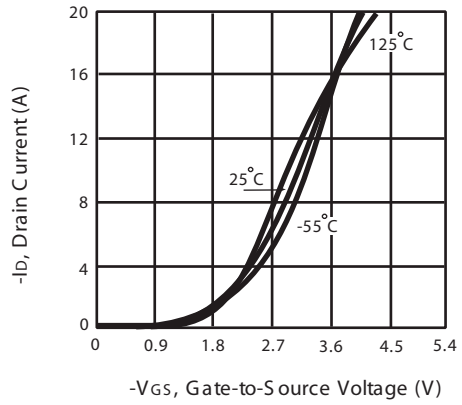


Figure 2. Transfer Characteristics

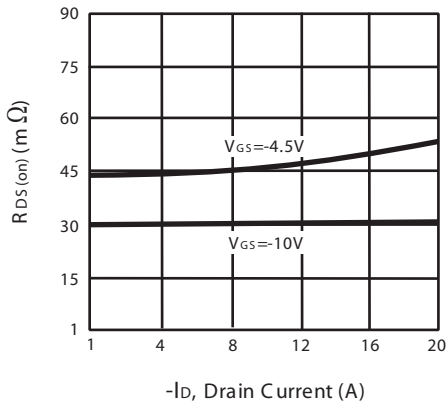


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

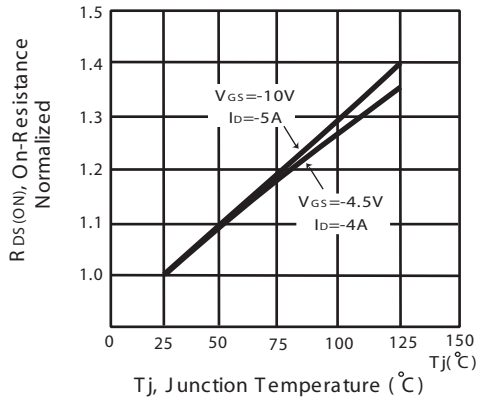
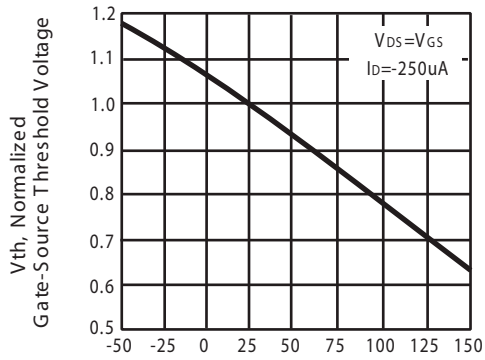


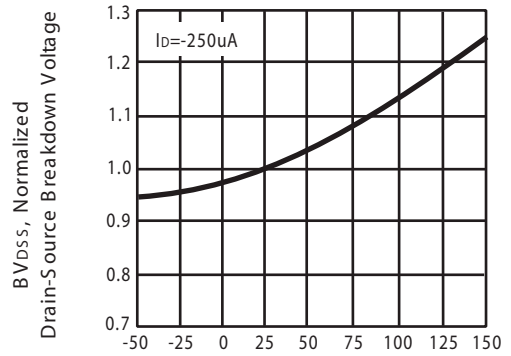
Figure 4. On-Resistance Variation with Drain Current and Temperature

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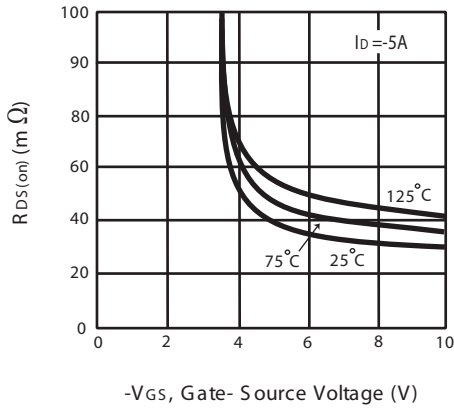
T_j , Junction Temperature (°C)

Figure 5. Gate Threshold Variation with Temperature



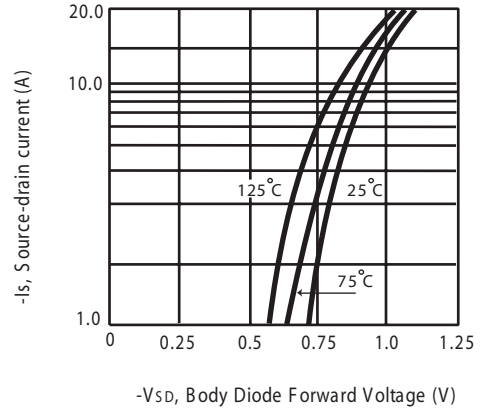
T_j , Junction Temperature (°C)

Figure 6. Breakdown Voltage Variation with Temperature



$-V_{GS}$, Gate- Source Voltage (V)

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



$-V_{SD}$, Body Diode Forward Voltage (V)

Figure 8. Body Diode Forward Voltage Variation with Source Current

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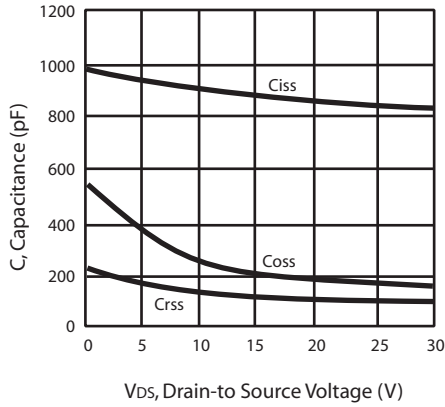


Figure 8. Capacitance

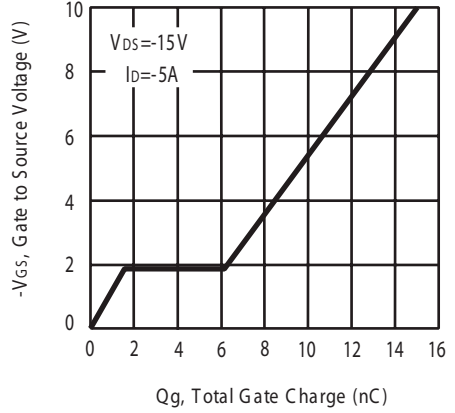


Figure 9. Gate Charge

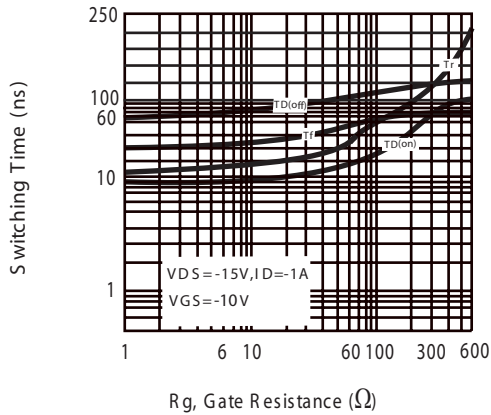


Figure 11. switching characteristics

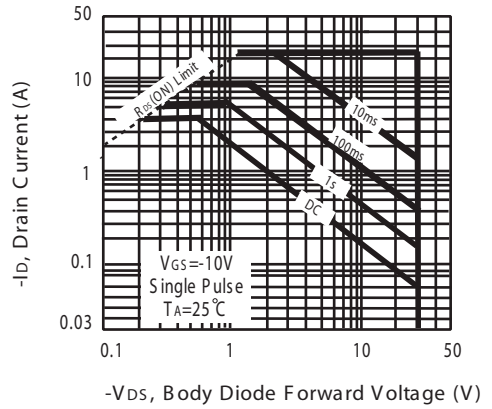


Figure 10. Maximum Safe Operating Area

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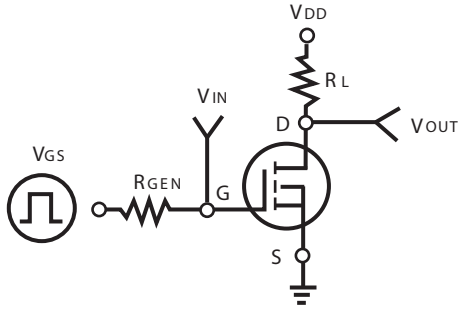


Figure 13. Switching Test Circuit

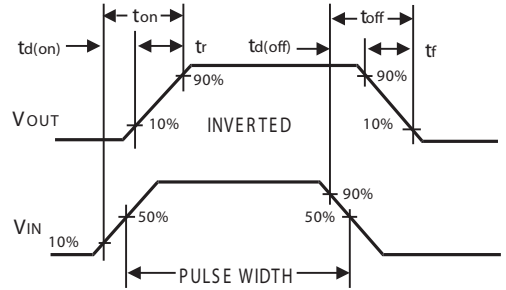
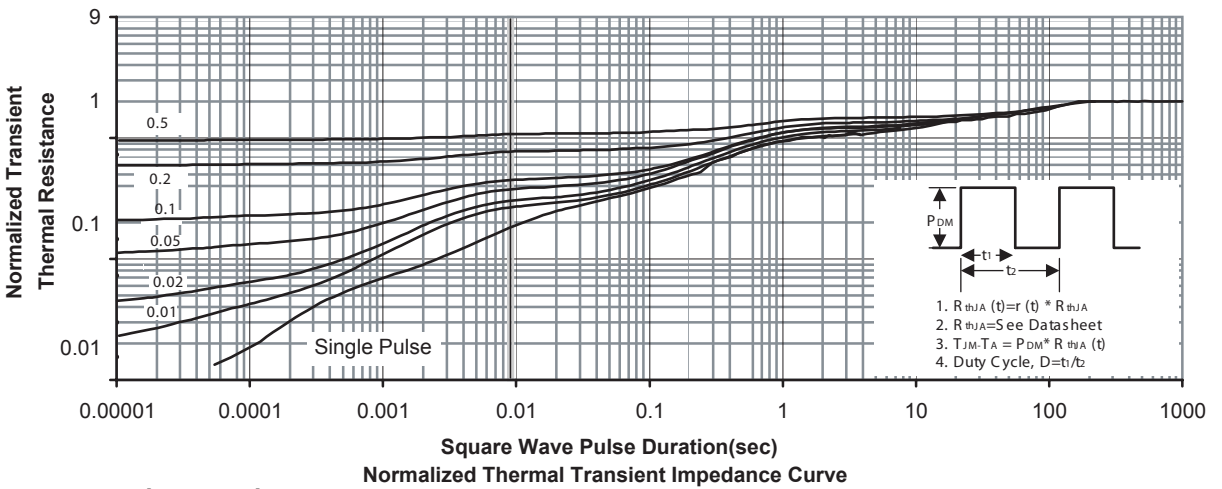
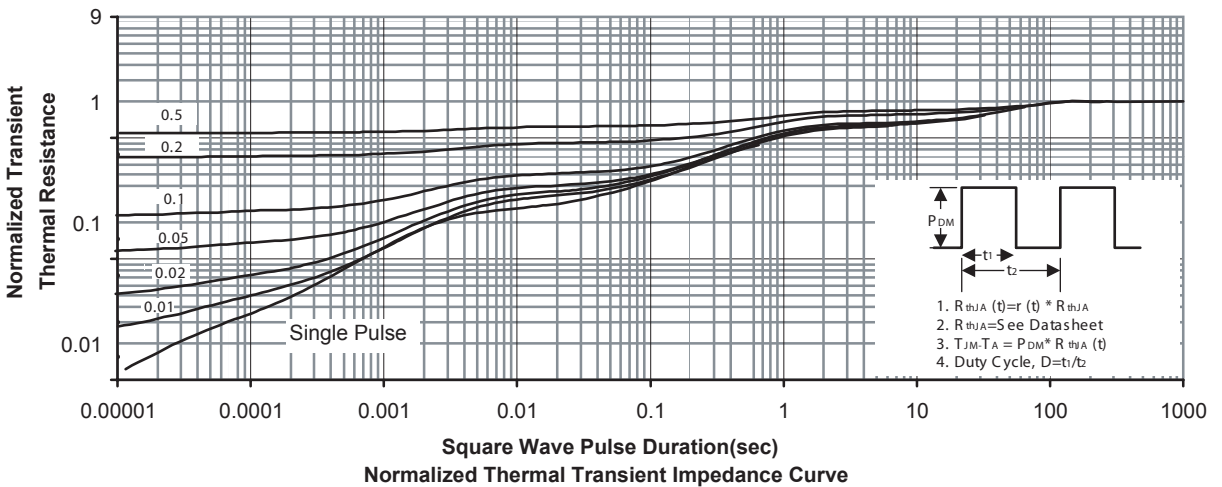


Figure 14. Switching Waveforms

N-Channel



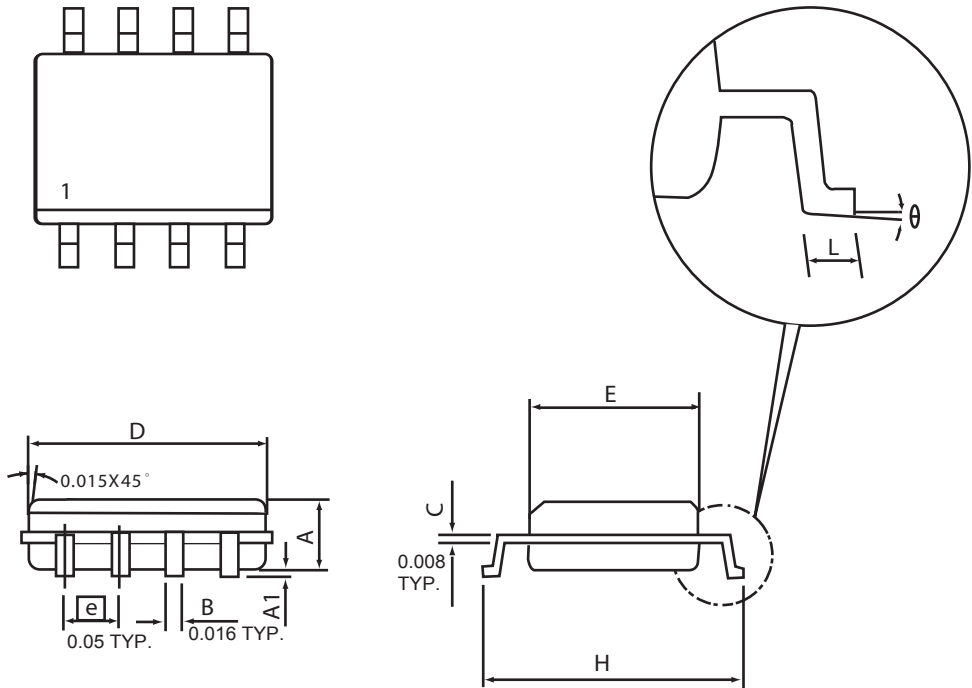
P-Channel



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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°