

30V N+P Dual Channel Enhancement MOSFET

Description

The DMC3400SDW-7 is the new generation 30V N+P Dual MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

Features

- Low Gate Charge
- Fast switching characteristic
- ESD protected gate
- Pb-free lead plating and halogen-free

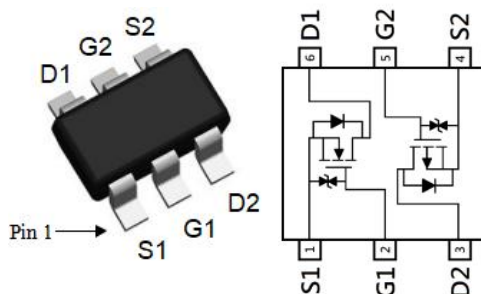
Applications

- Notebook
- Load Switch
- Power Management

V_{DSS}	30V	-30V
I_D	0.57A	-0.52A
$R_{DS(ON)}$	$0.4\Omega @ V_{GS}=10V$	$1.1\Omega @ V_{GS}=-10V$
$R_{DS(ON)}$	$0.5\Omega @ V_{GS}=4.5V$	$1.3\Omega @ V_{GS}=-4.5V$

Outline

SOT-363 Pin Configuration



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
DMC3400SDW-7	SOT-363		3000

Absolute Maximum Ratings

Parameter		Symbol	Limit		Units
Drain-Source Voltage		V _{DS}	30	-30	V
Gate-Source Voltage		V _{GS}	±20	±12	V
Drain Current-Continuous ^(Note2)	T _A =25°C	I _D	0.57	-0.52	A
	T _A =70°C		0.45	-0.42	A
-Pulsed ^(Note 1、 Note 2)		I _{DM}	2.28	-2.08	A
Maximum Power Dissipation	T _A =25°C	P _D	0.5	0.5	W
	T _A =70°C		0.3	0.3	W
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150		°C
Thermal Resistance Junction-Ambient		R _{θJA}	260		°C /W

Electrical Characteristics (T_C=25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
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} =30V , V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	0.7	0.9	1.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =0.2A		0.4	0.6	Ω
		V _{GS} =4.5V , I _D =0.2A		0.5	0.7	Ω
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =15V , V _{GS} =0 V , f =1.0MHz		19		pF
Output Capacitance	C _{OSS}			5.3		pF
Reverse Transfer Capacitance	C _{RSS}			2.6		pF
Total Gate Charge	Q _g	V _{DS} =15V , I _D =0.2A , V _{GS} =10V		1.1		nC
Gate-Source Charge	Q _{gs}			0.25		nC
Gate-Drain Charge	Q _{gd}			0.2		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =15V , I _D =0.2A , V _{GS} =10V , R _G =25Ω		5.2		ns
Rise Time	t _r			18		ns
Turn-Off Delay Time	t _{D(OFF)}			22		ns
Fall Time	t _f			20		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =0.2A			1.0	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

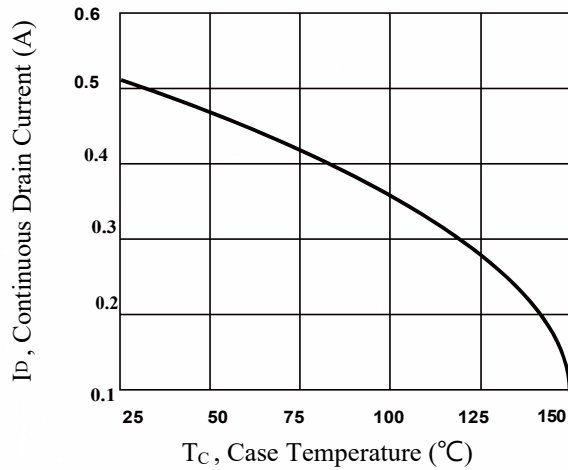


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

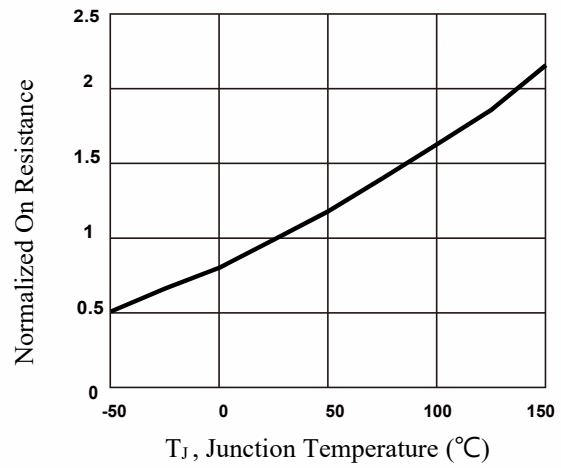


Fig.3 Normalized V_{th} vs. T_J

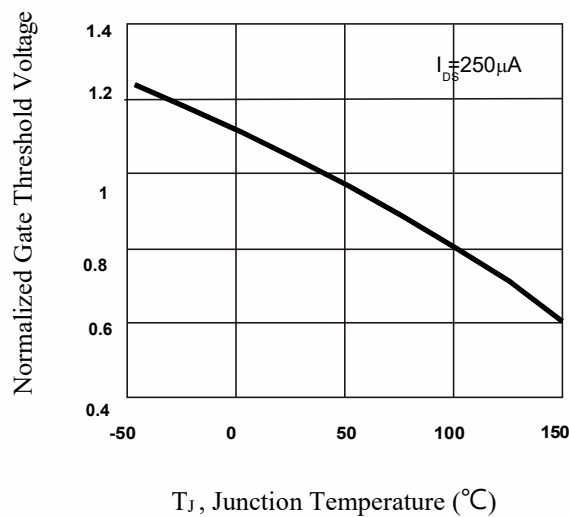


Fig.4 Gate Charge Waveform

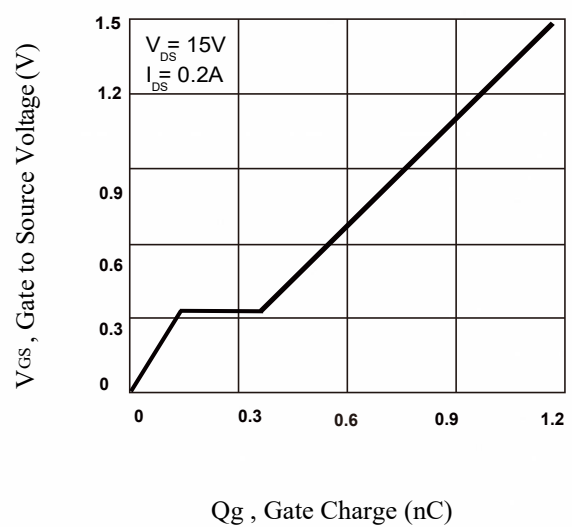


Fig.5 Typical Output Characteristics

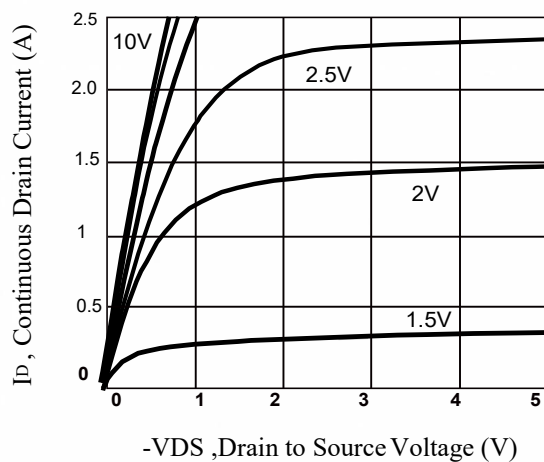


Fig.6 Capacitance

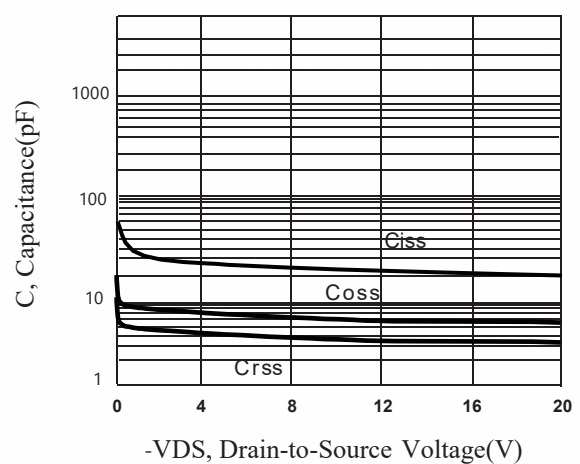


Fig.7 Turn-On Resistance vs. ID

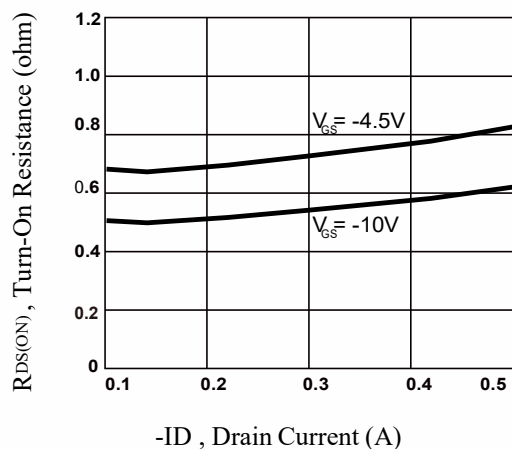


Fig.8 Typical Source-Drain Diode Forward Voltage

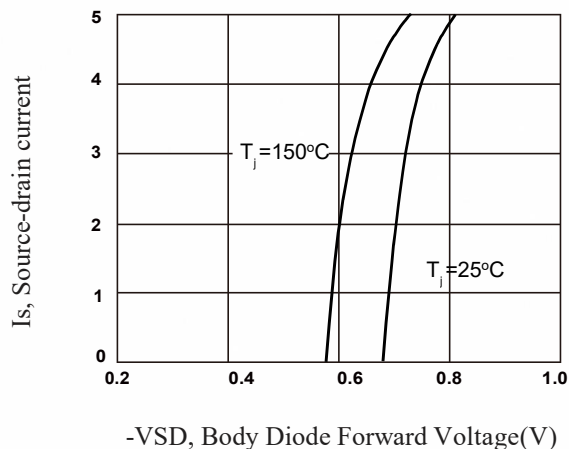


Fig.9 Normalized Transient Impedance

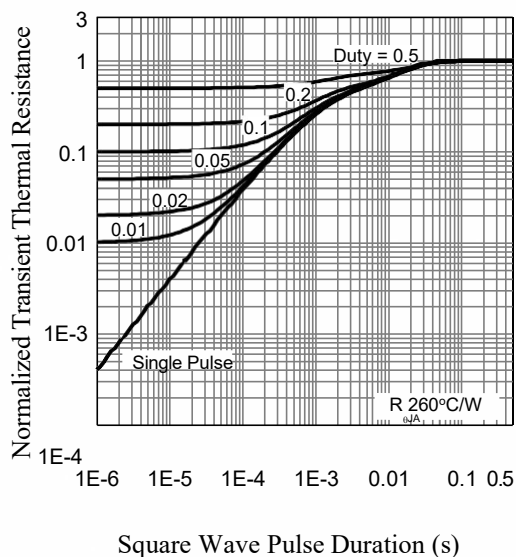


Fig.10 Maximum Safe Operation Area

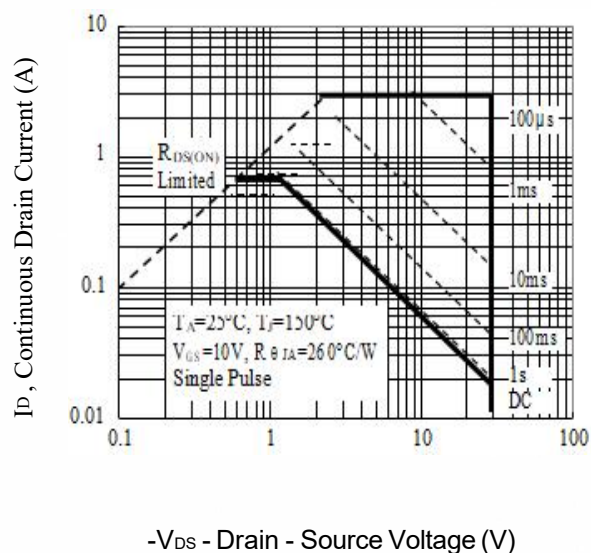


Figure11a. Switching Test Circuit

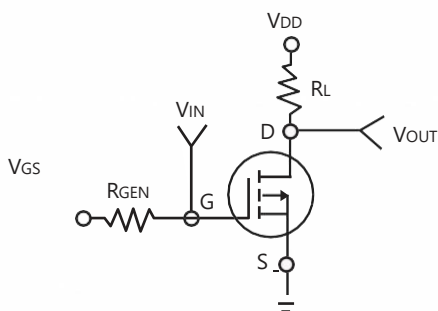
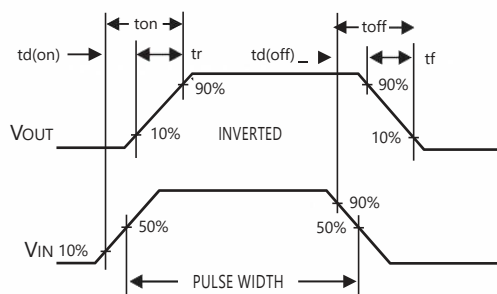


Figure11b. Switching Waveforms



Electrical Characteristics ($T_C=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
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} =-30V , V _{GS} =0V			-1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±12V , V _{DS} =0V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250uA	-0.7	-1.0	-1.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V , I _D =-0.2A		1.1	1.2	Ω
		V _{GS} =-4.5V , I _D =-0.2A		1.3	1.5	Ω
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =-15V , V _{GS} =0 V , f =1.0MHz		28		pF
Output Capacitance	C _{OSS}			5.4		pF
Reverse Transfer Capacitance	C _{RSS}			3		pF
Total Gate Charge	Q _g	V _{DS} =-15V , I _D =-0.2A , V _{GS} =-10V		1.2		nC
Gate-Source Charge	Q _{gs}			0.3		nC
Gate-Drain Charge	Q _{gd}			0.25		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =-15V , I _D =-0.2A , V _{GS} =-10V , R _G =25Ω		6.2		ns
Rise Time	tr			20		ns
Turn-Off Delay Time	t _{D(OFF)}			34		ns
Fall Time	tf			22		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =-0.2A			-1.0	V

Notes:

- 1、Pulse Test Width < 300us, Duty Cycle < 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

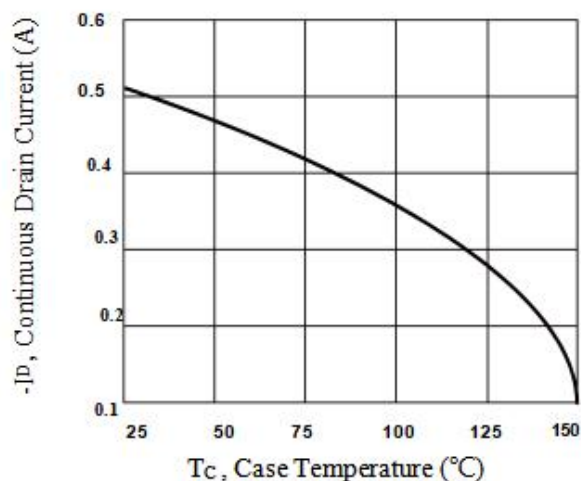


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

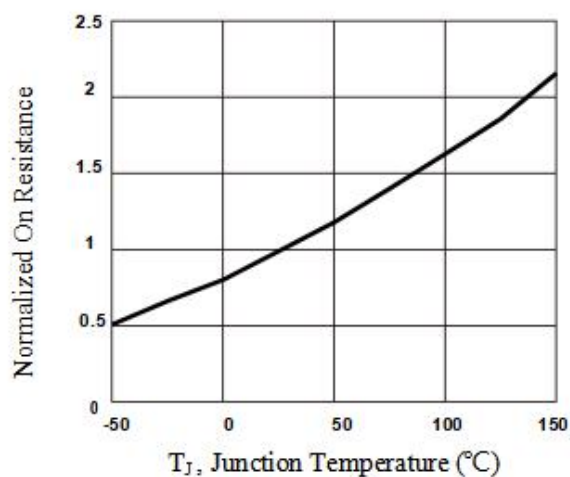


Fig.3 Normalized V_{th} vs. T_J

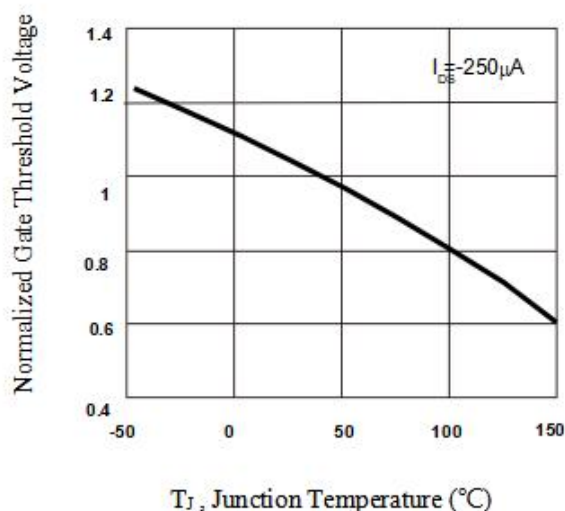


Fig.4 Gate Charge Waveform

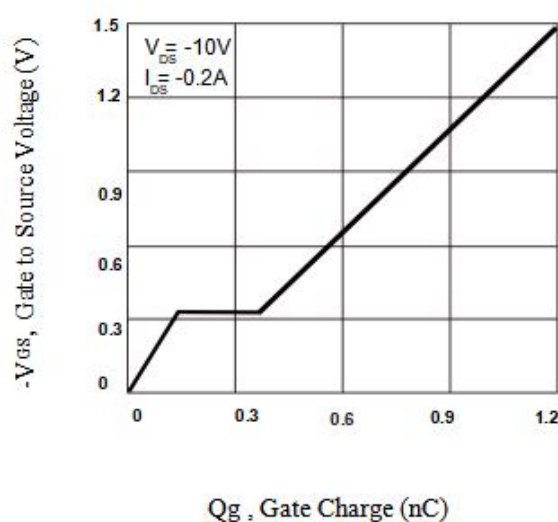


Fig.5 Typical Output Characteristics

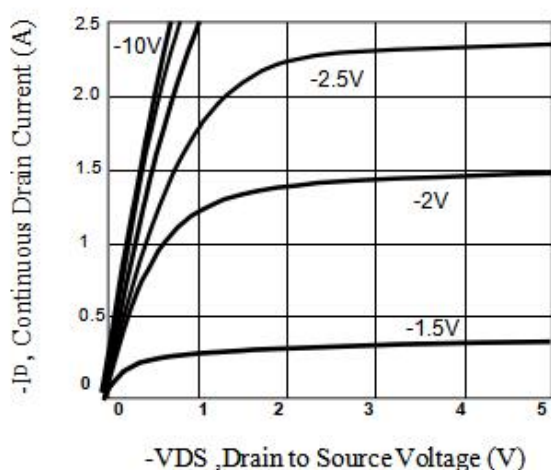


Fig.6 Capacitance

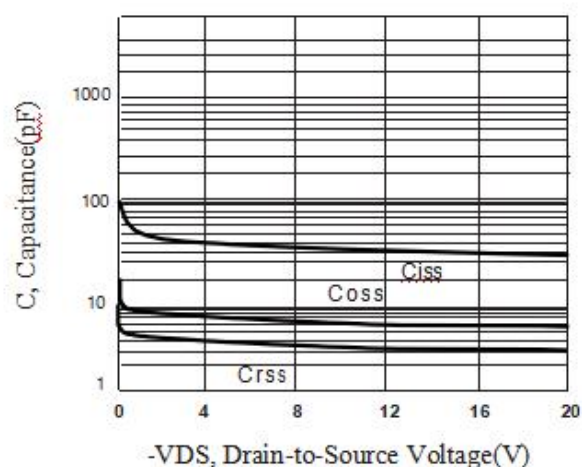


Fig.7 Turn-On Resistance vs. ID

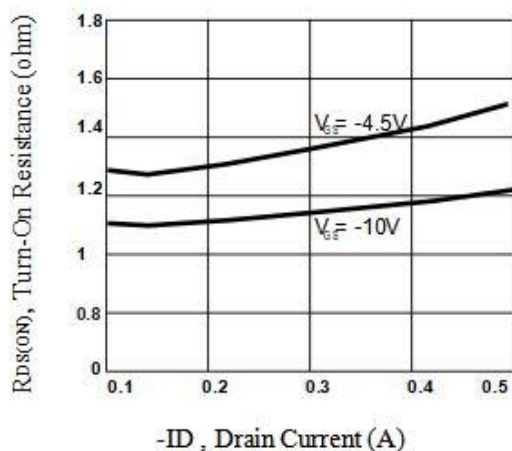


Fig.8 Typical Source-Drain Diode Forward Voltage

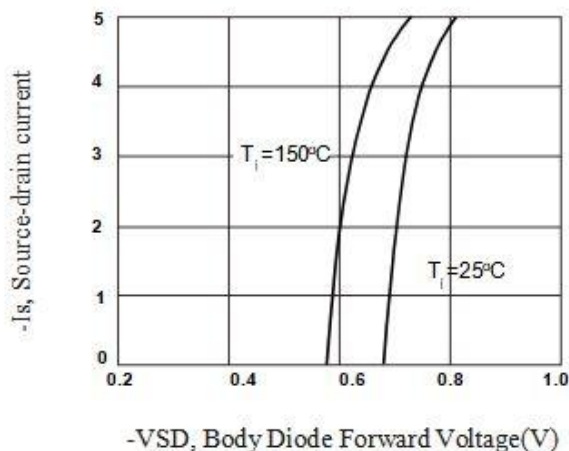


Fig.9 Normalized Transient Impedance

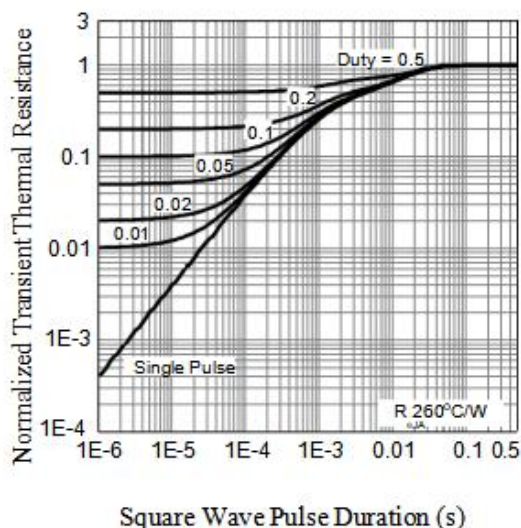


Fig.10 Maximum Safe Operation Area

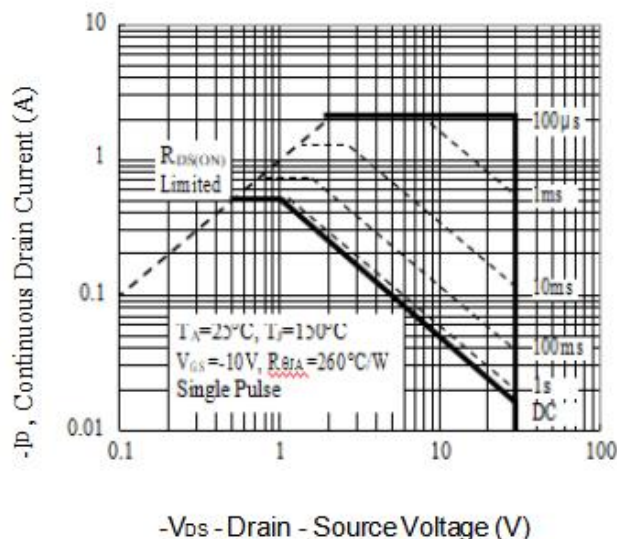


Figure11a. Switching Test Circuit

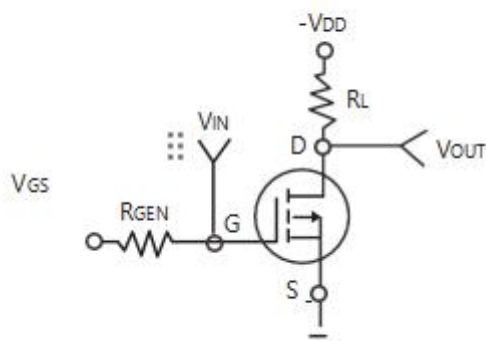
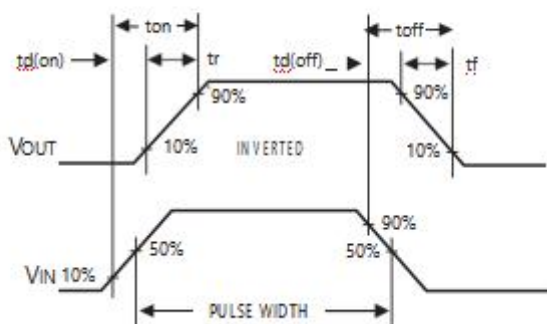
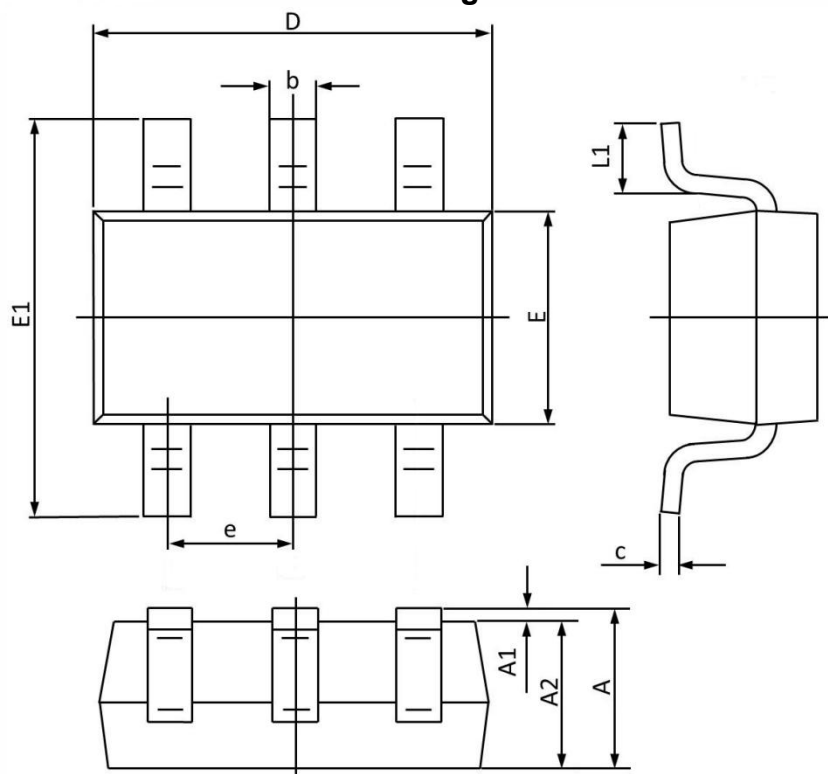


Figure11b. Switching Waveforms



SOT-363 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.330	0.100	0.013	0.004
c	0.250	0.100	0.010	0.004
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.400	1.800	0.094	0.071
e	0.65BSC		0.026BSC	
L1	0.350	0.100	0.014	0.004

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