

1.Features

- $V_{DS(V)} = -30V$
- $I_D = -9.2A$
- $R_{DS(ON)} < 19.4m\Omega (V_{GS}=10V)$
- $R_{DS(ON)} < 32.5m\Omega (V_{GS}=4.5V)$
- RoHS Compliant Containing no Lead,
- no Bromide and no Halogen

2.Application

- Adaptor Input Switch
for Notebook PC

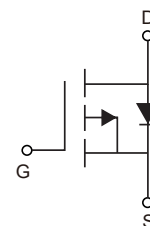
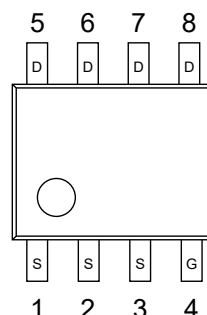
3.Benefits

- Direct Drive at High V_{GS}
- Multi-Vendor Compatibility
- Environmentally Friendlier

4.Pinning information

Pin	Symbol	Description
1,2,3	S	SOURCE
4	G	GATE
5,6,7,8	D	DRAIN

SOP-8



5.Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain- Source Voltage		V_{DS}	-30	V
Gate-to-Source Voltage		V_{GS}	± 25	V
Continuous Drain Current, $V_{GS}=10V$	$T_A=25^\circ C$	I_D	-9.2	A
Continuous Drain Current, $V_{GS}=10V$	$T_A=70^\circ C$		-7.3	A
Pulsed Drain Current ①		I_{DM}	-75	A
Power Dissipation ④	$T_A=25^\circ C$	P_D	2.5	W
Power Dissipation ④	$T_A=70^\circ C$		1.6	W
Linear Derating Factor			0.02	W/ $^\circ C$
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$



6. Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$	-30			V
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D = -1\text{mA}$, Reference to 25°C		0.019		V/ $^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = -10\text{V}$, $I_D = -9.2\text{A}$ ③		15.6	19.4	m Ω
		$V_{GS} = -4.5\text{V}$, $I_D = -7.5\text{A}$ ③		25.6	32.5	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -25\mu\text{A}$	-1.3	-1.8	3.25	V
Gate Threshold Voltage Coefficient	$\Delta V_{GS(th)}$			-5.7	-2.4	mV/ $^\circ\text{C}$
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS} = -24\text{V}$, $V_{GS} = 0\text{V}$			-1	μA
		$V_{DS} = -24\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 125^\circ\text{C}$			-150	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS} = -25\text{V}$			-10	μA
Gate-to-Source Reverse Leakage		$V_{GS} = 25\text{V}$			10	μA
Forward Transconductance	g_{FS}	$V_{DS} = -10\text{V}$, $I_D = -7.5\text{A}$	13			S
Total Gate Charge ⑥	Q_g	$V_{DS} = -15\text{V}$, $V_{GS} = -4.5\text{V}$, $I_D = -7.5\text{A}$		14		nC
Total Gate Charge ⑥	Q_g	$V_{DS} = -10\text{V}$		25	38	nC
Gate-to-Source Charge ⑥	Q_{gs}	$V_{GS} = -15\text{V}$		3.5		nC
Gate-to-Drain Charge ⑥	Q_{gd}	$I_D = -7.5\text{A}$		6.4		nC
Gate Resistance ⑥	R_g			15		Ω
Turn-On Delay Time	$t_{D(on)}$	$V_{DD} = -15\text{V}$, $V_{GS} = -4.5\text{V}$ ③ $I_D = -1\text{A}$ $R_G = 6.8\Omega$ See Figs. 20a & 20b		16		ns
Rise Time	t_r			44		ns
Turn-Off Delay Time	$t_{D(off)}$			55		ns
Fall Time	t_f			49		ns
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$		1110		pF
Output Capacitance	C_{oss}	$V_{DS} = -25\text{V}$		230		pF
Reverse Transfer Capacitance	C_{rss}	$f = 1.0\text{MHz}$		160		pF
Avalanche Characteristics						
Single Pulse Avalanche Energy ②	E_{AS}				100	mJ
Avalanche Current ①	I_{AR}				-7.5	A



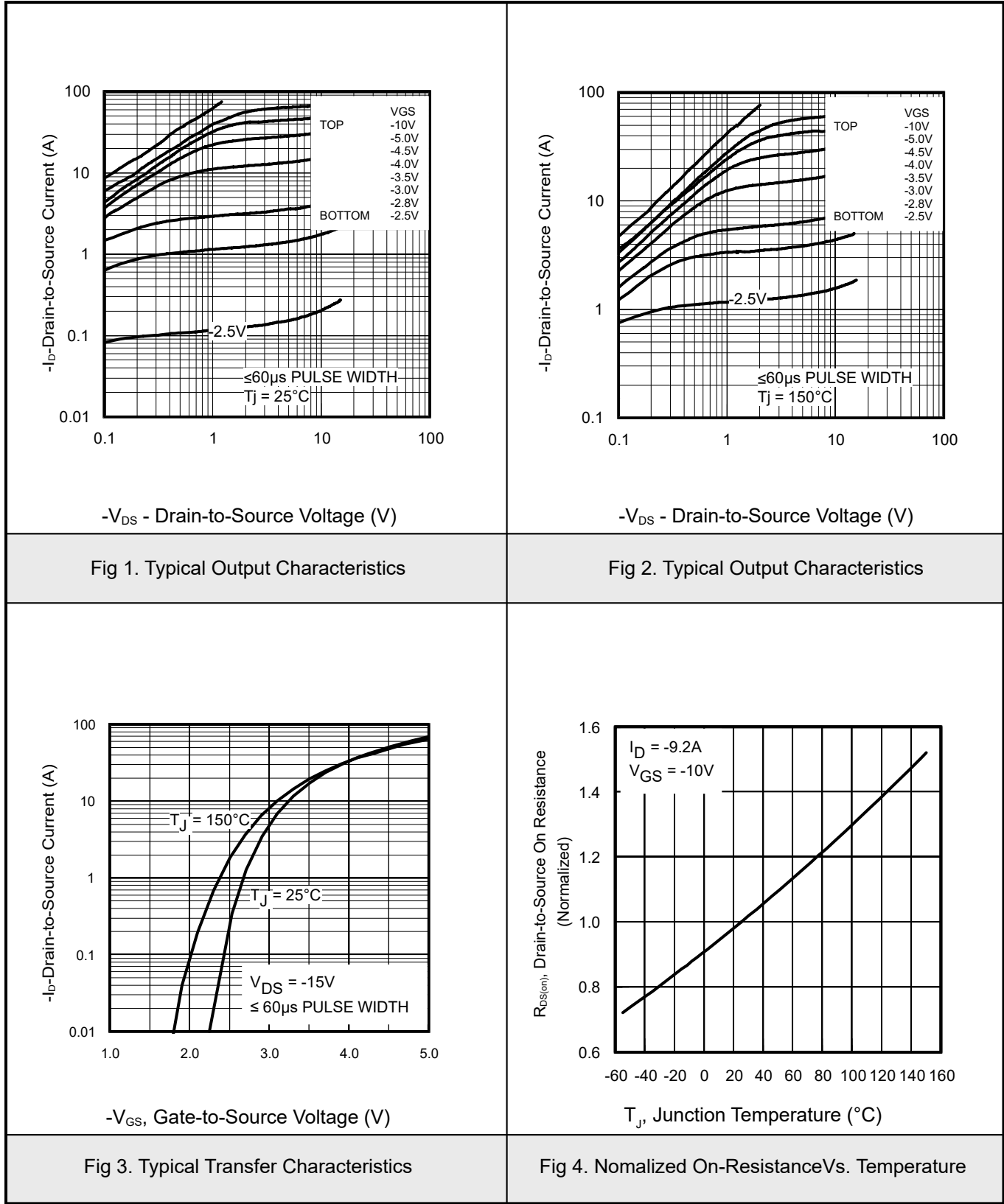
Diode Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-2.5	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-75	
Diode Forward Voltage	V_{SD}		$T_J=25^\circ\text{C}, I_S=-2.5\text{A}, V_{GS}=0\text{V}$ ③		-1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=-2.5\text{A}, V_{DD}=-24\text{V}$		24	36	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt=100\text{A}/\mu\text{s}$ ③		15	23	nC
Thermal Resistance						
Junction-to-Drain Lead ⑤	$R_{\theta JL}$				20	$^\circ\text{C}/\text{W}$
Junction-to-Ambient ④	$R_{\theta JA}$				50	$^\circ\text{C}/\text{W}$

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J=25^\circ\text{C}$, $L=3.5\text{mH}$, $R_G=25\Omega$, $I_{AS}=-7.5\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ When mounted on 1 inch square copper board.
- ⑤ R_θ is measured at T_J of approximately 90°C .
- ⑥ For DESIGN AID ONLY, not subject to production testing.

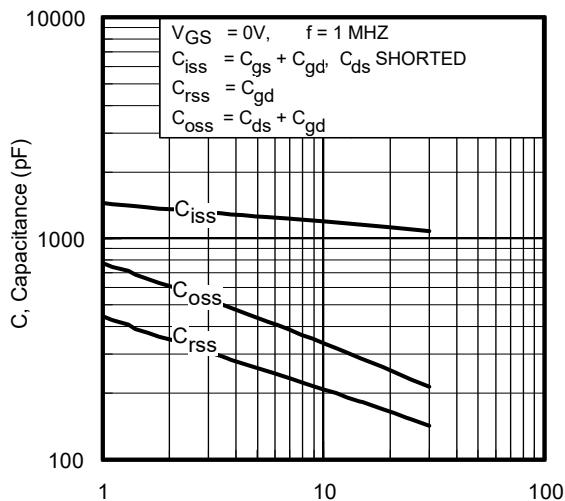


7.1Typical Characterisitics



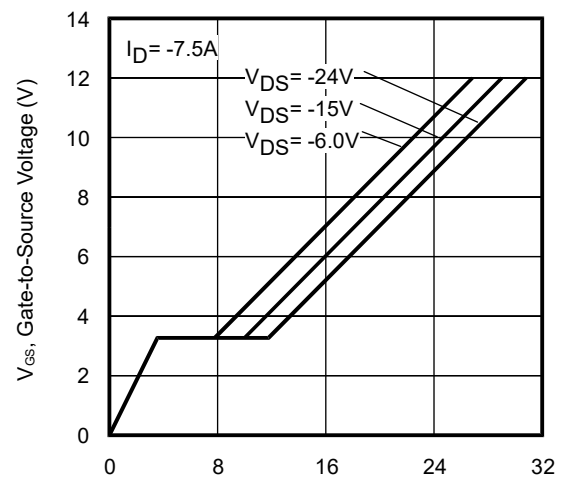


7.2 Typical Characteristics



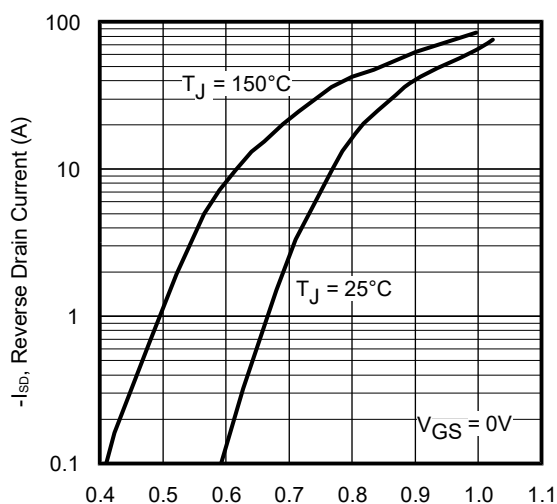
$-V_{DS}$, Drain-to-Source Voltage (V)

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage



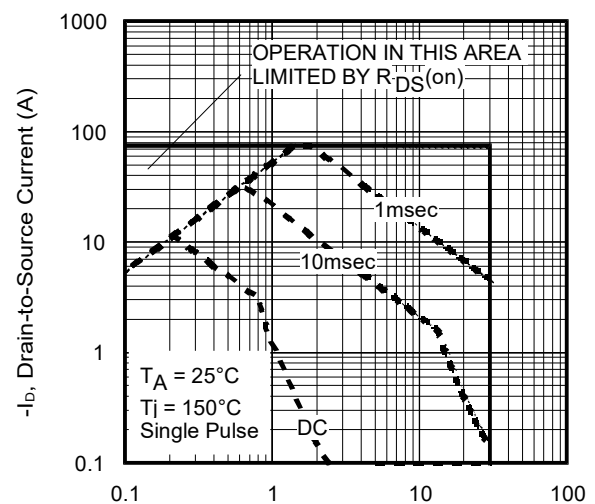
Q_G , Total Gate Charge (nC)

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage



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

Fig 7. Typical Source-Drain Diode Forward Voltage

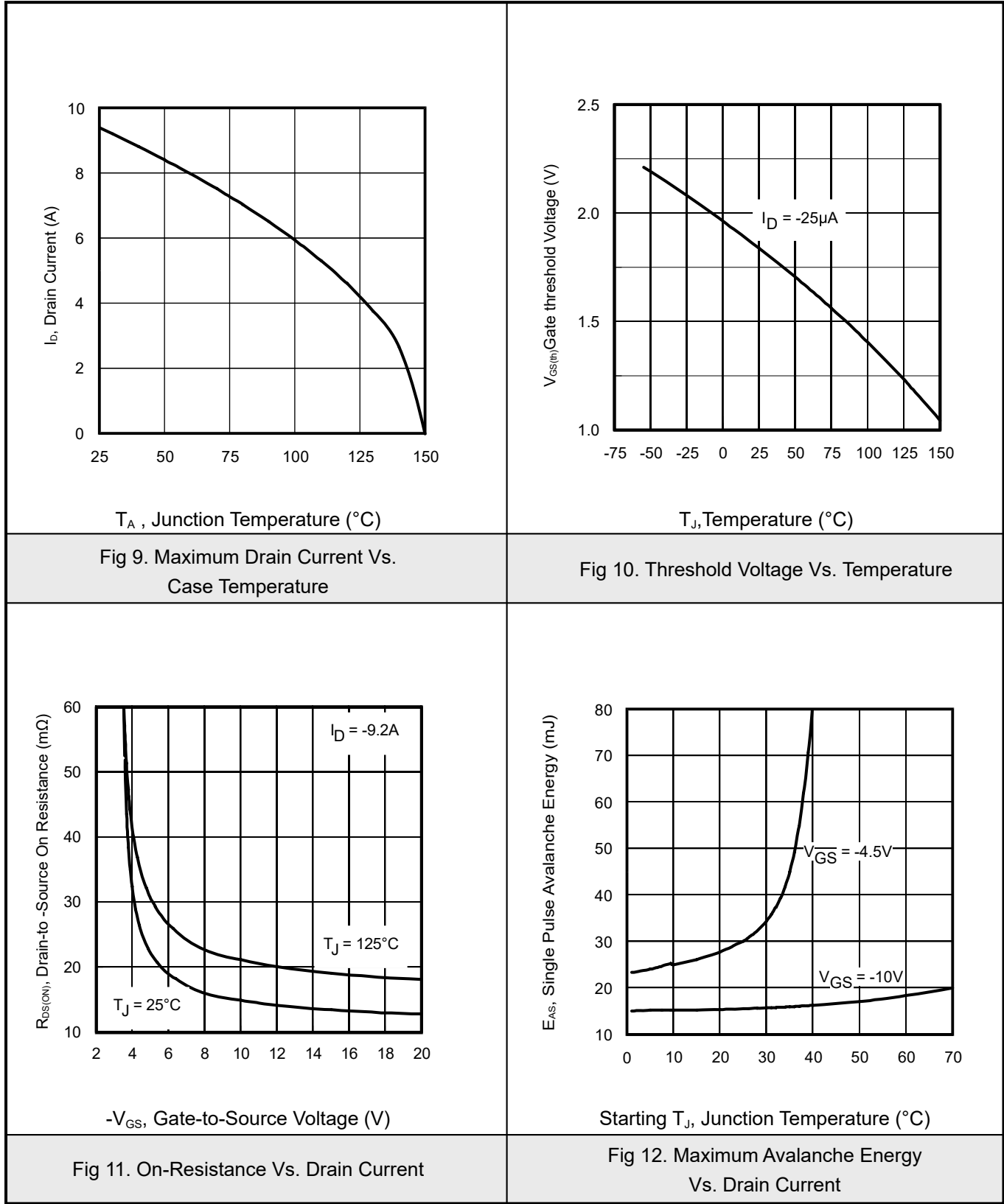


$-V_{DS}$, Drain-to-Source Voltage (V)

Fig 8. Maximum Safe Operating Area

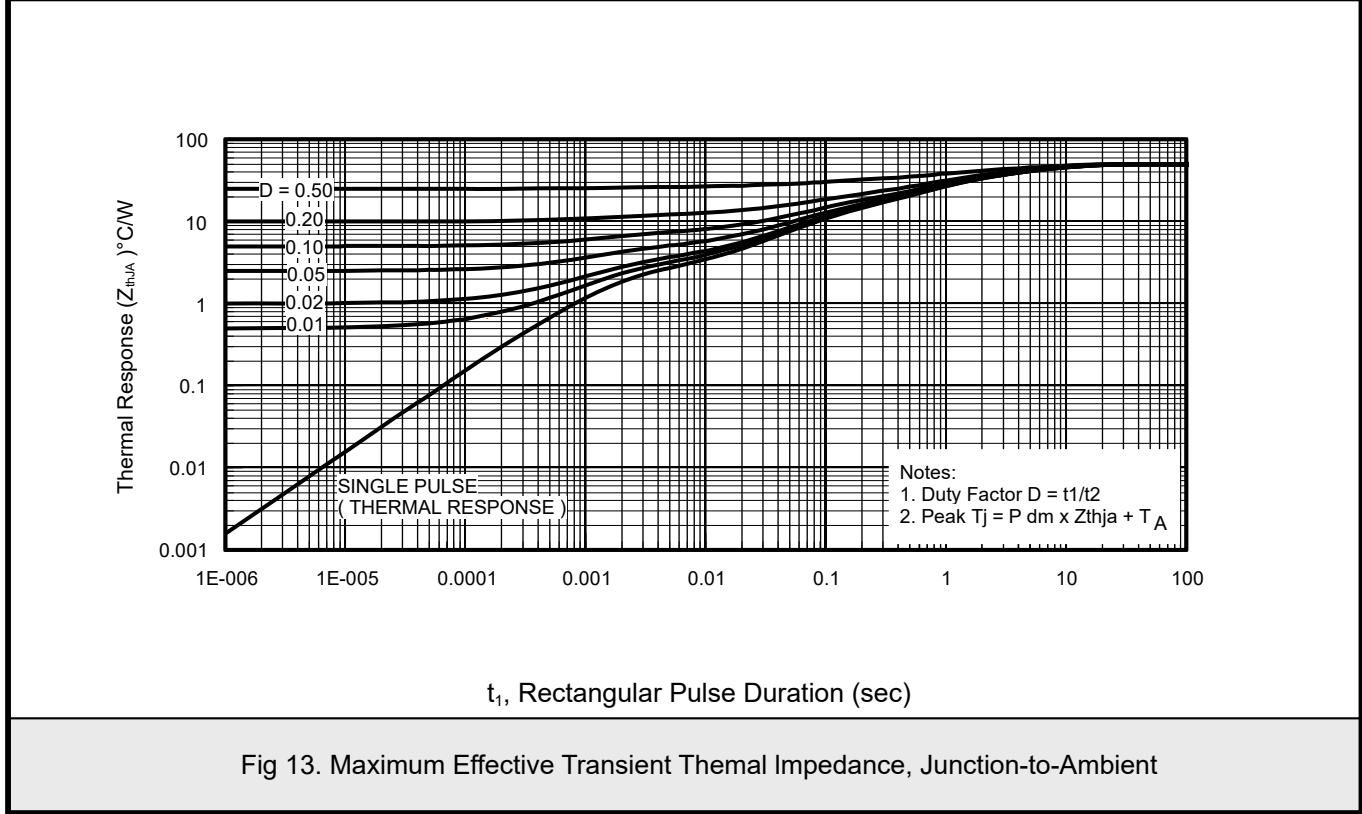
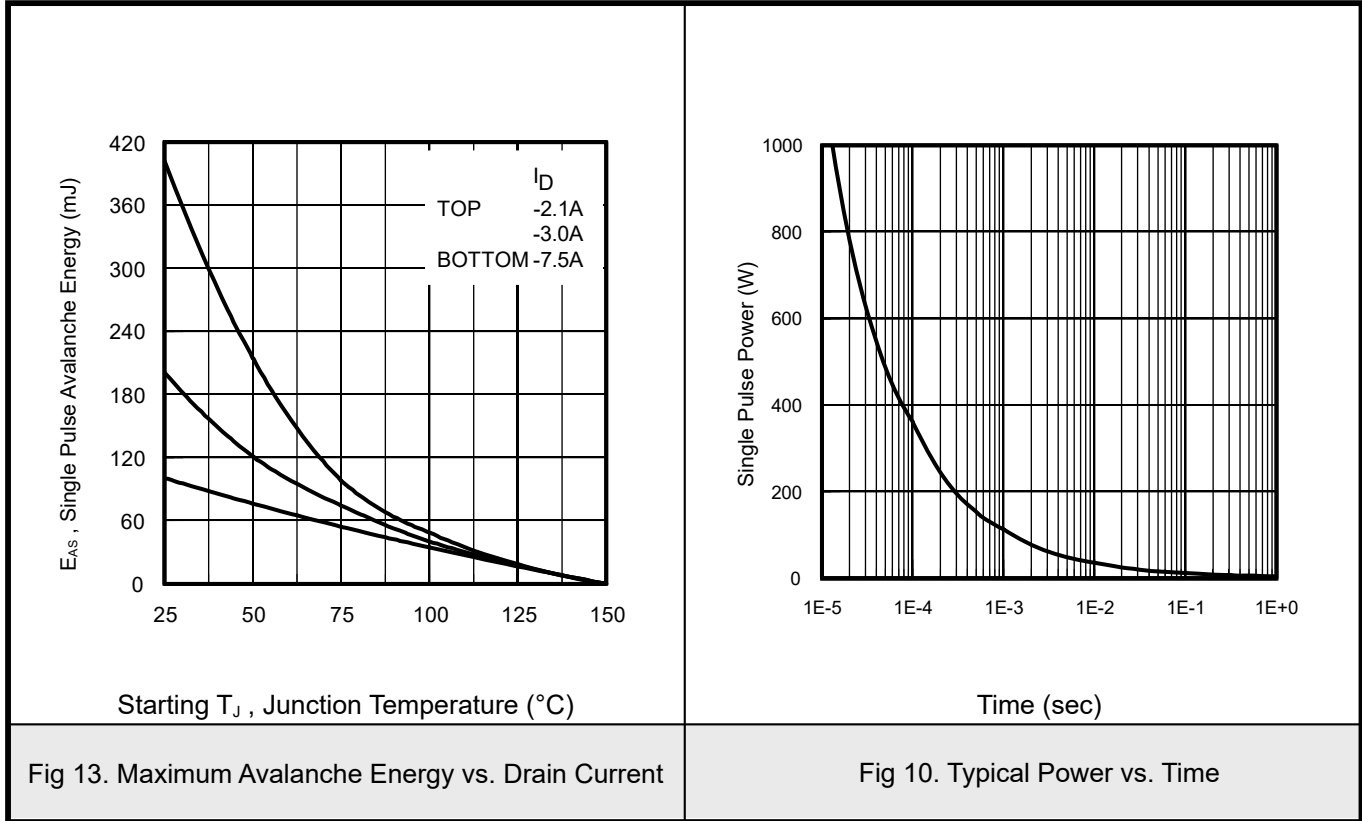


7.3Typical Characterisitics





7.4Typical Characterisitics





7.5 Typical Characteristics

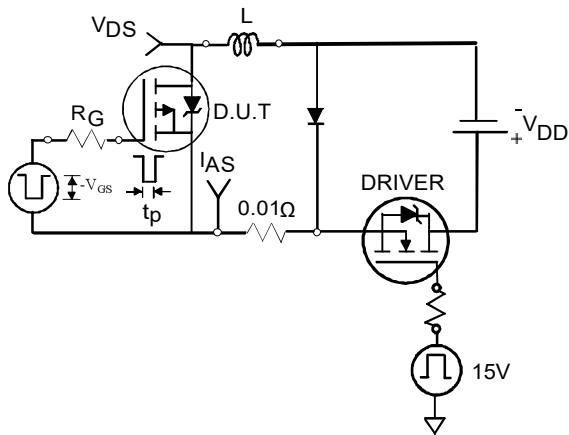


Fig 19a. Unclamped Inductive Test Circuit

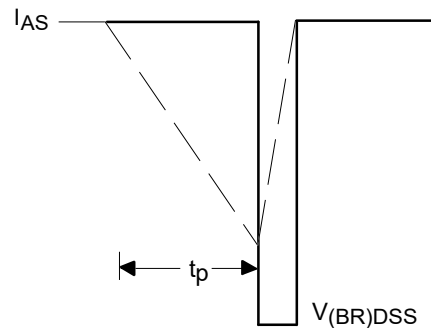


Fig 19b. Unclamped Inductive Waveforms

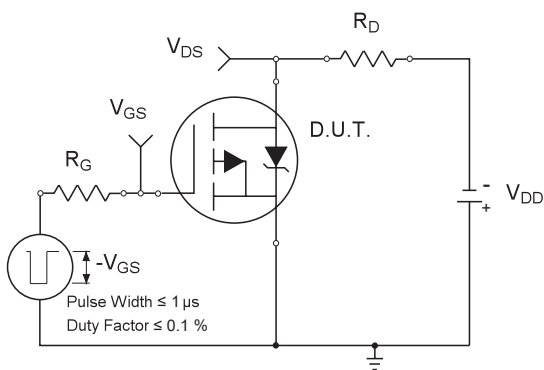


Fig 20a. Switching Time Test Circuit

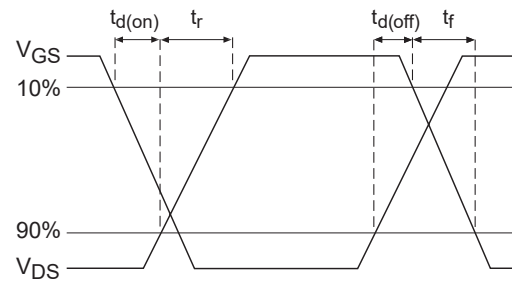
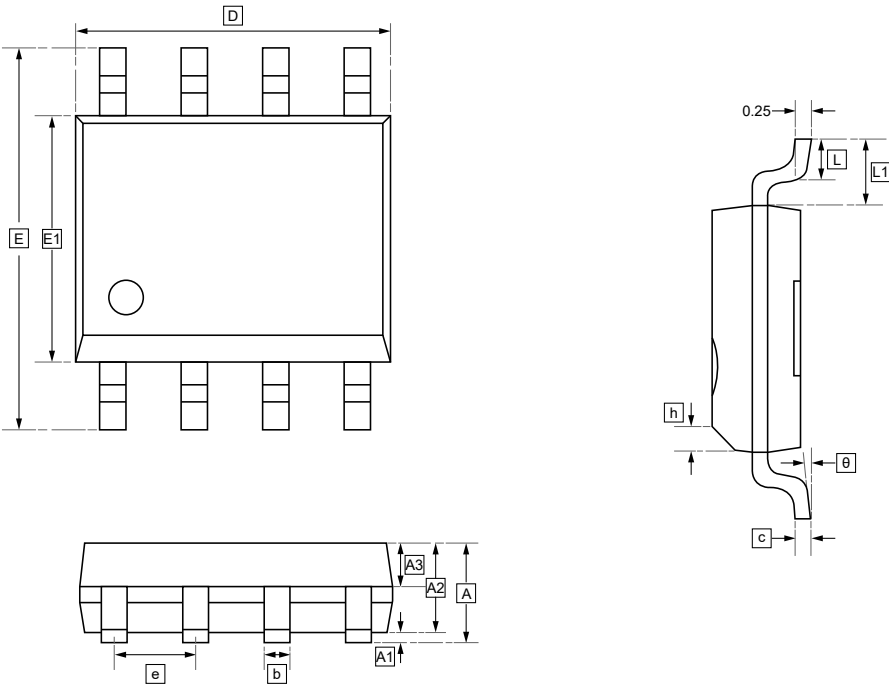


Fig 20b. Switching Time Waveforms



8.SOP-8 Package Outline Dimensions



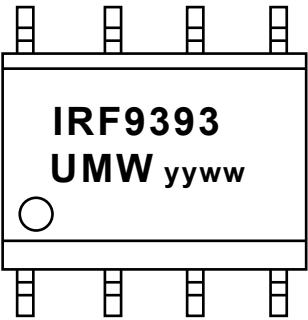
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.00	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF9393TR	SOP-8	3000	Tape and reel



10.Disclaimer

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