IRF7343

Dual N + P Channel MOSFET

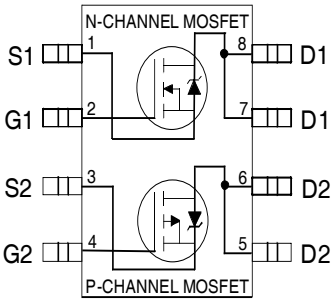
Features

N-Ch:

- $V_{DS\ (V)}$=55V
- $R_{DS(ON)}$ < 50mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 65 mΩ (V_{GS} = 4.5V)

P-Ch:

- $V_{DS\ (V)}$=-55V
- $R_{DS(ON)}$ < 90mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 100mΩ (V_{GS} = 4.5V)
- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount
- Fully Avalanche Rated
- Lead-Free



Top View

Description

The SOP-8 has been modified through a customized leadirame for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. with these improvements. mutipe devices can be used in an appication with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques.

Absolute Maximum Ratings

	Parameter	Max.		Units
		N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage	55	-55	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	4.7	-3.4	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	3.8	-2.7	
I_{DM}	Pulsed Drain Current ①	38	-27	
P_D@T_A = 25°C	Maximum Power Dissipation ⑤	2.0		W
P_D@T_A = 70°C	Maximum Power Dissipation ⑤	1.3		W
E_{AS}	Single Pulse Avalanche Energy③	72	114	mJ
I_{AR}	Avalanche Current	4.7	-3.4	A
E_{AR}	Repetitive Avalanche Energy	0.20		mJ
V_{GS}	Gate-to-Source Voltage	± 20		V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150		℃

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ⑤		62.5	℃/W

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	N-Ch	55			V	V_{GS} = 0V, I_D = 250μA
		P-Ch	-55				V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch		0.059		V/°C	Reference to 25°C, I_D = 1mA
		P-Ch		0.054			Reference to 25°C, I_D = -1mA
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	N-Ch		43	50	mΩ	V_{GS} = 10V, I_D = 4.7A ④
				56	65		V_{GS} = 4.5V, I_D = 3.8A ④
		P-Ch		70	90		V_{GS} = -10V, I_D = -3.4A ④
				95	100		V_{GS} = -4.5V, I_D = -2.7A ④
$V_{GS(th)}$	Gate Threshold Voltage	N-Ch	1.0			V	V_{DS} = V_{GS}, I_D = 250μA
		P-Ch	-1.0				V_{DS} = V_{GS}, I_D = -250μA
g_{fs}	Forward Transconductance	N-Ch	7.9			S	V_{DS} = 10V, I_D = 4.5A ④
		P-Ch	3.3				V_{DS} = -10V, I_D = -3.1A ④
I_{DSS}	Drain-to-Source Leakage Current	N-Ch			2.0	μA	V_{DS} = 55V, V_{GS} = 0V
		P-Ch			-2.0		V_{DS} = -55V, V_{GS} = 0V
		N-Ch			25		V_{DS} = 55V, V_{GS} = 0V, T_J = 55°C
		P-Ch			-25		V_{DS} = -55V, V_{GS} = 0V, T_J = 55°C
I_{GSS}	Gate-to-Source Forward Leakage	N-P			±100	nA	V_{GS} = ±20V
Q_g	Total Gate Charge	N-Ch		24	36	nC	N-Channel I_D = 4.5A, V_{DS} = 44V, V_{GS} = 10V ④ P-Channel I_D = -3.1A, V_{DS} = -44V, V_{GS} = -10V
		P-Ch		26	38		
Q_{gs}	Gate-to-Source Charge	N-Ch		2.3	3.4		
		P-Ch		3.0	4.5		
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch		7.0	10		
		P-Ch		8.4	13		
$t_{d(on)}$	Turn-On Delay Time	N-Ch		8.3	12	ns	N-Channel V_{DD} = 28V, I_D = 1.0A, R_G = 6.0Ω, R_D = 16Ω ④ P-Channel V_{DD} = -28V, I_D = -1.0A, R_G = 6.0Ω, R_D = 16Ω
		P-Ch		14	22		
t_r	Rise Time	P-Ch		10	15		
		P-Ch		10	15		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch		32	48		
		P-Ch		43	64		
t_f	Fall Time	N-Ch		13	20		
		P-Ch		22	32		
C_{iss}	Input Capacitance	N-Ch		740		pF	N-Channel V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz P-Channel V_{GS} = 0V, V_{DS} = -25V, f = 1.0MHz
		P-Ch		690			
C_{oss}	Output Capacitance	N-Ch		190			
		P-Ch		210			
C_{rss}	Reverse Transfer Capacitance	N-Ch		71			
		P-Ch		86			

Source-Drain Ratings and Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	N-Ch			2.0	A	
		P-Ch			-2.0		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch			38		
		P-Ch			-27		
V_{SD}	Diode Forward Voltage	N-Ch		0.70	1.2	V	T_J = 25°C, I_S = 2.0A, V_{GS} = 0V ③
		P-Ch		-0.80	-1.2		T_J= 25°C, I_S = -2.0A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	N-Ch		60	90	ns	N-Channel T_J = 25°C, I_F =2.0A, di/dt = 100A/μs P-Channel ④ T_J = 25°C, I_F = -2.0A, di/dt = 100A/μs
		P-Ch		54	80		
Q_{rr}	Reverse Recovery Charge	N-Ch		120	170	nC	
		P-Ch		85	130		

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 22)

② N-Channel I_{SD} ≤ 4.7A, di/dt ≤ 220A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C
P-Channel I_{SD} ≤ -3.4A, di/dt ≤ -150A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

③ N-Channel Starting T_J = 25°C, L = 6.5mH R_G = 25Ω, I_{AS} = 4.7A.
P-Channel Starting T_J = 25°C, L = 20mH R_G = 25Ω, I_{AS} = -3.4A.

④ Pulse width ≤ 300μs; duty cycle ≤ 2%.

⑤ Surface mounted on FR-4 board, t ≤ 10sec.

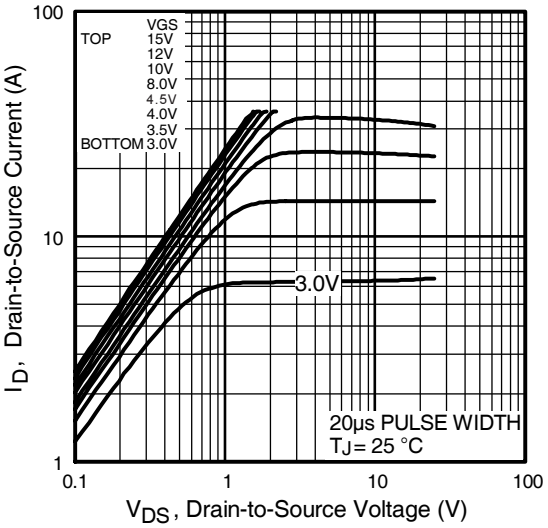


Fig 1. Typical Output Characteristics

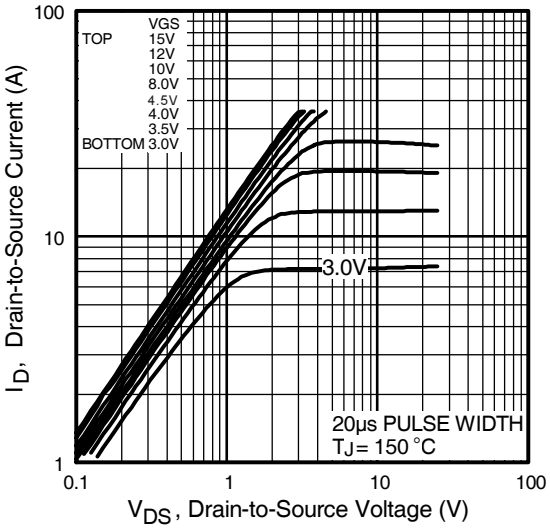


Fig 2. Typical Output Characteristics

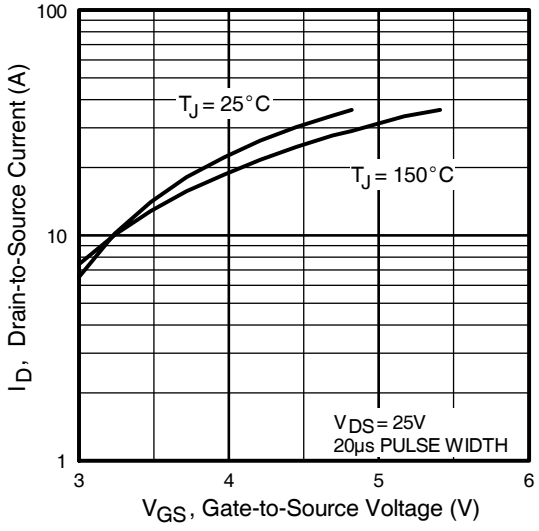


Fig 3. Typical Transfer Characteristics

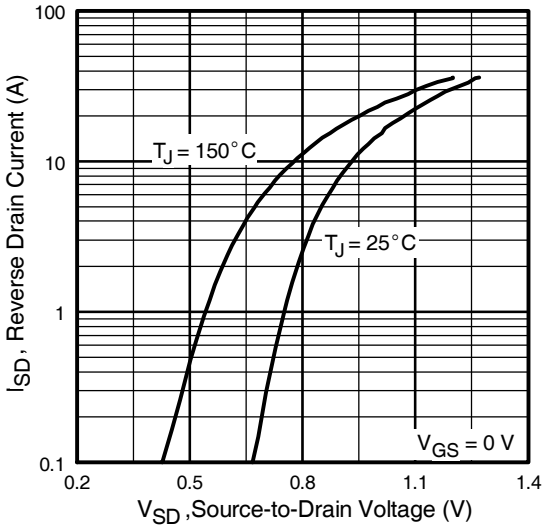


Fig 4. Typical Source-Drain Diode Forward Voltage

N-Channel

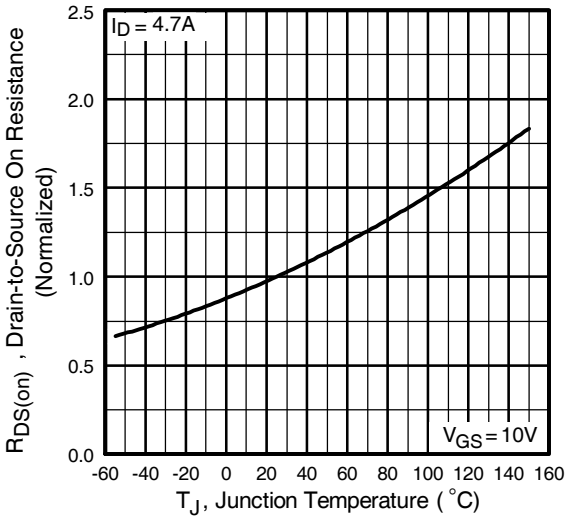


Fig 5. Normalized On-Resistance Vs. Temperature

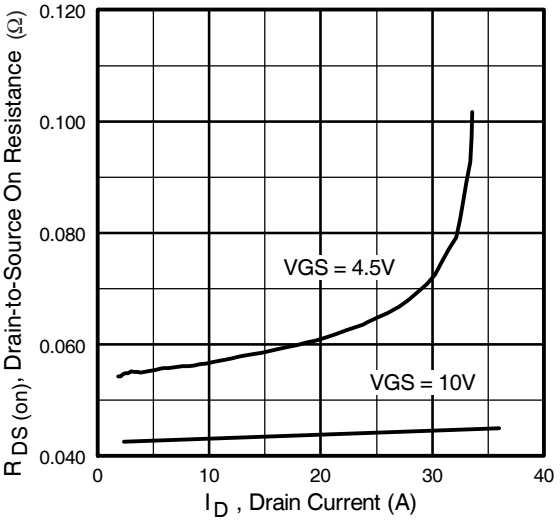


Fig 6. Typical On-Resistance Vs. Drain Current

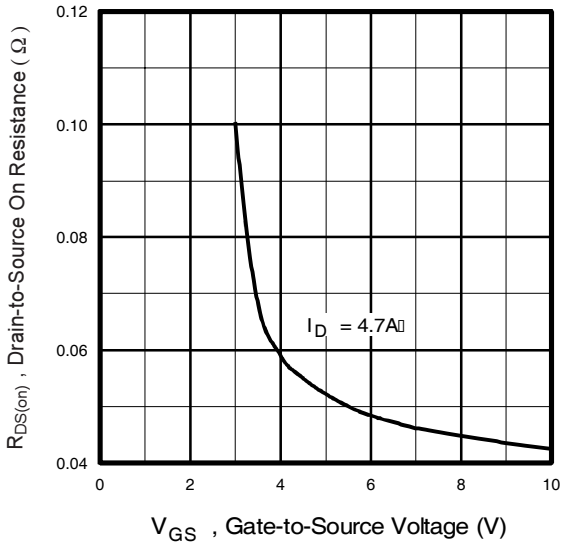


Fig 7. Typical On-Resistance Vs. Gate Voltage

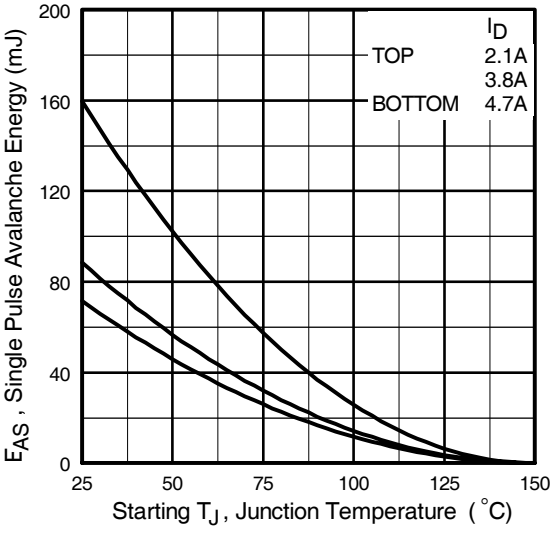


Fig 8. Maximum Avalanche Energy Vs. Drain Current

N-Channel

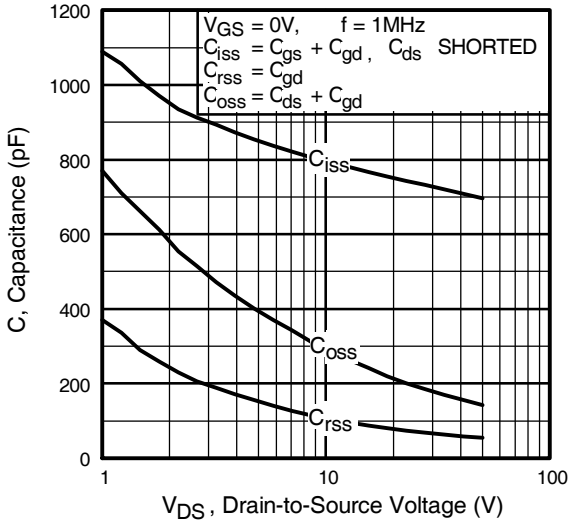


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

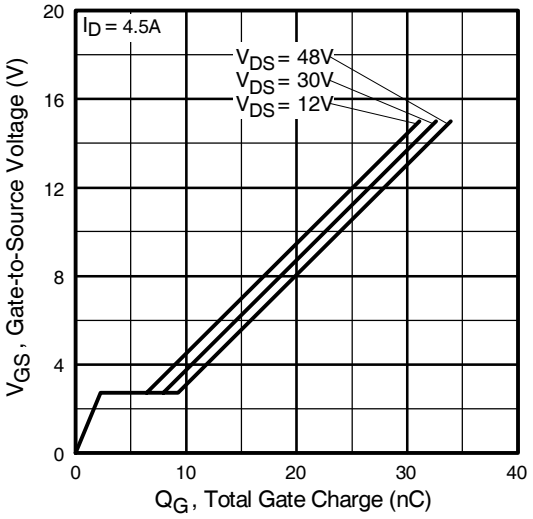


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

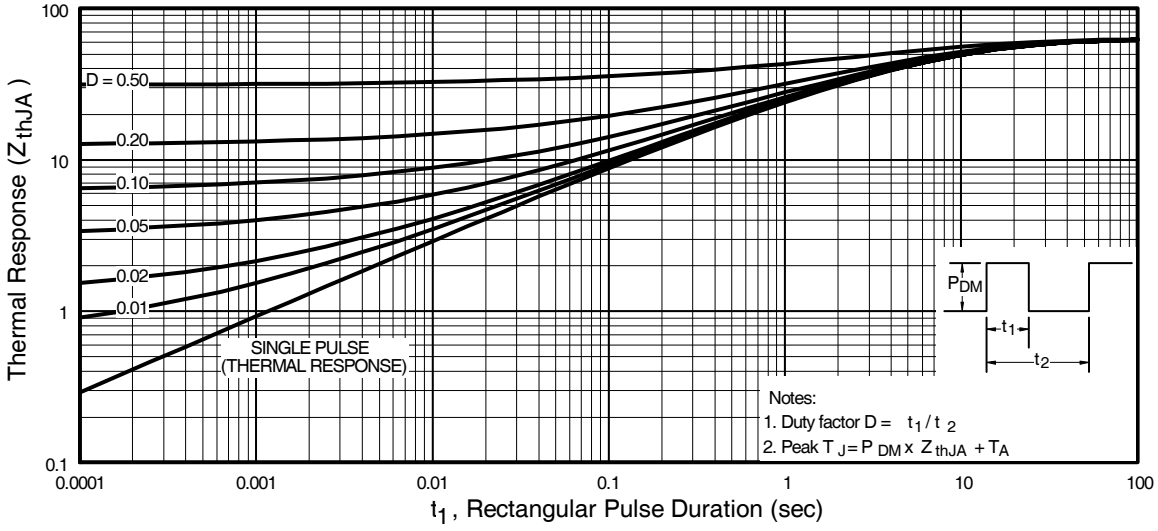


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

P-Channel

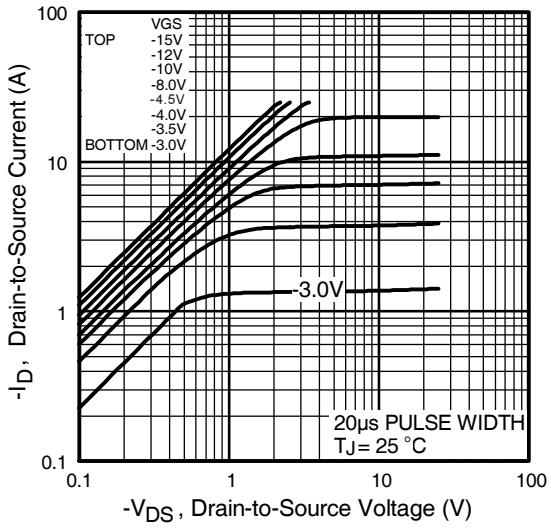


Fig 12. Typical Output Characteristics

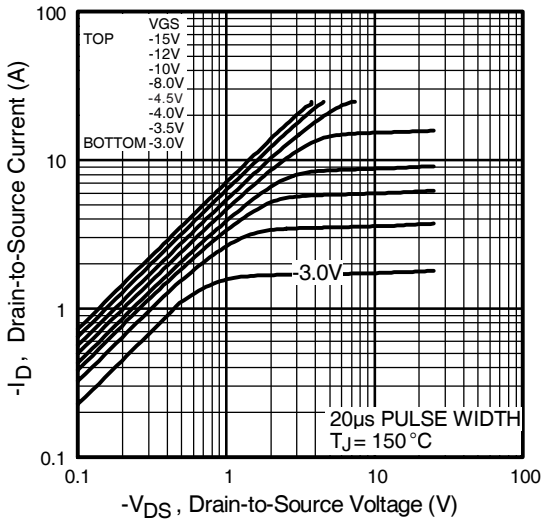


Fig 13. Typical Output Characteristics

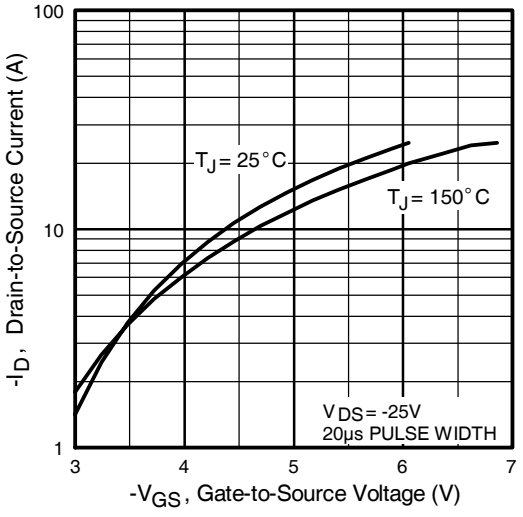


Fig 14. Typical Transfer Characteristics

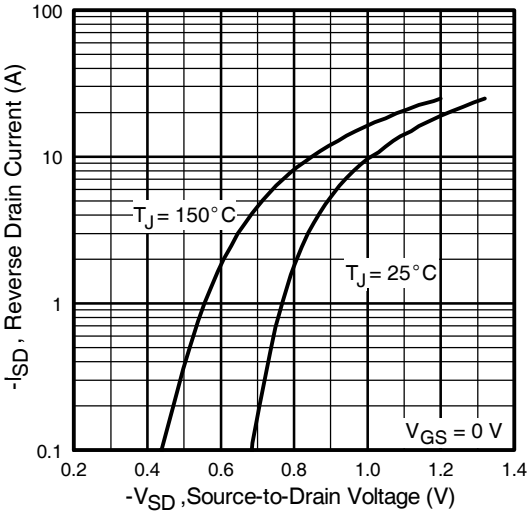


Fig 15. Typical Source-Drain Diode Forward Voltage

P-Channel

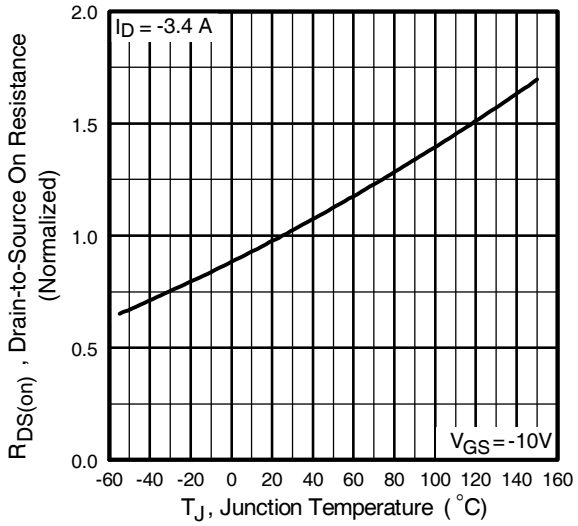


Fig 16. Normalized On-Resistance Vs. Temperature

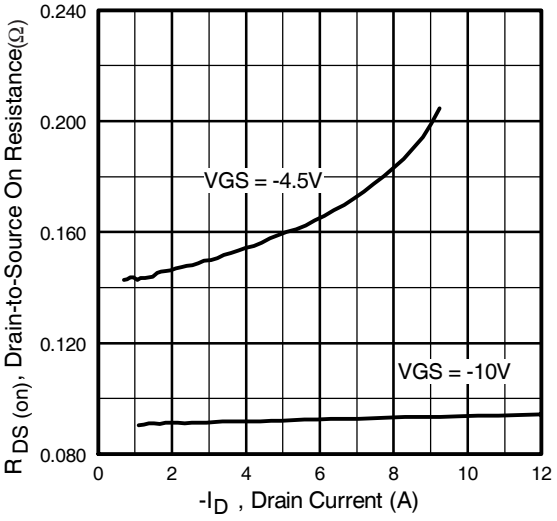


Fig 17. Typical On-Resistance Vs. Drain Current

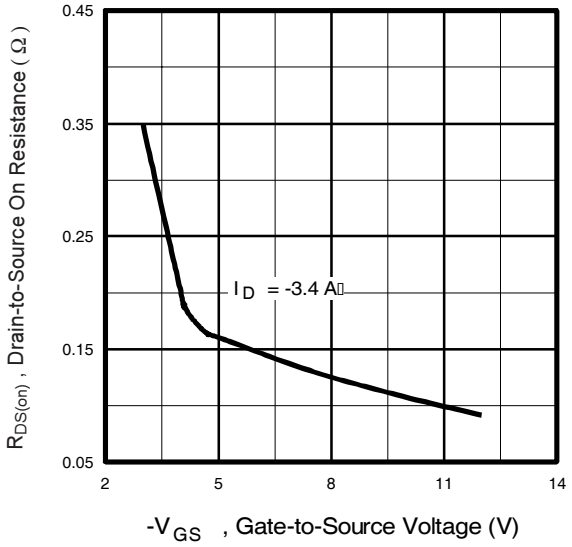


Fig 18. Typical On-Resistance Vs. Gate Voltage

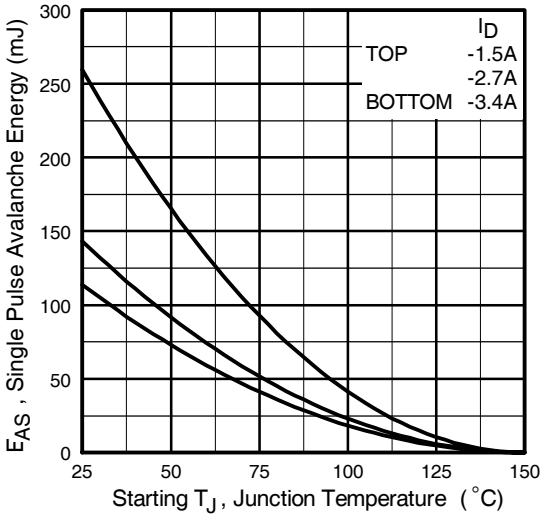


Fig 19. Maximum Avalanche Energy Vs. Drain Current

P-Channel

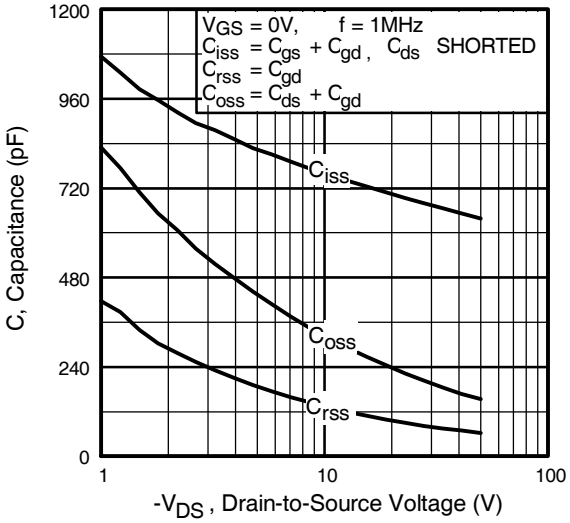


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

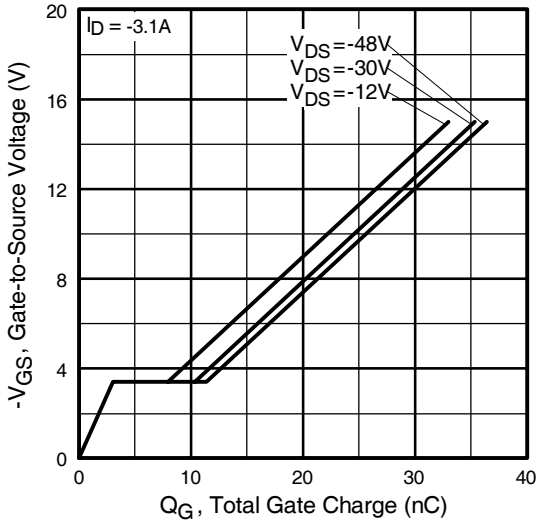


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

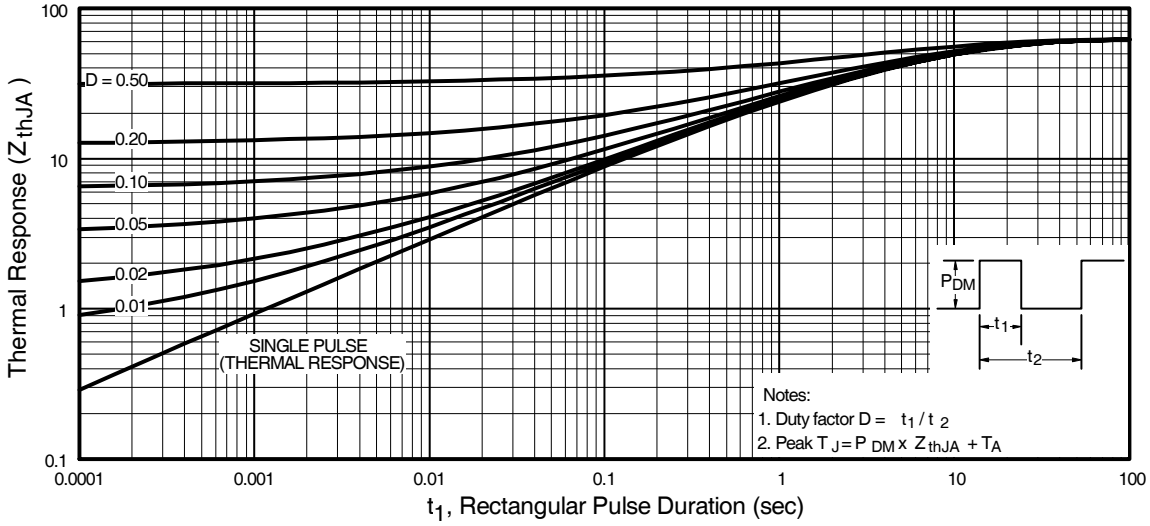
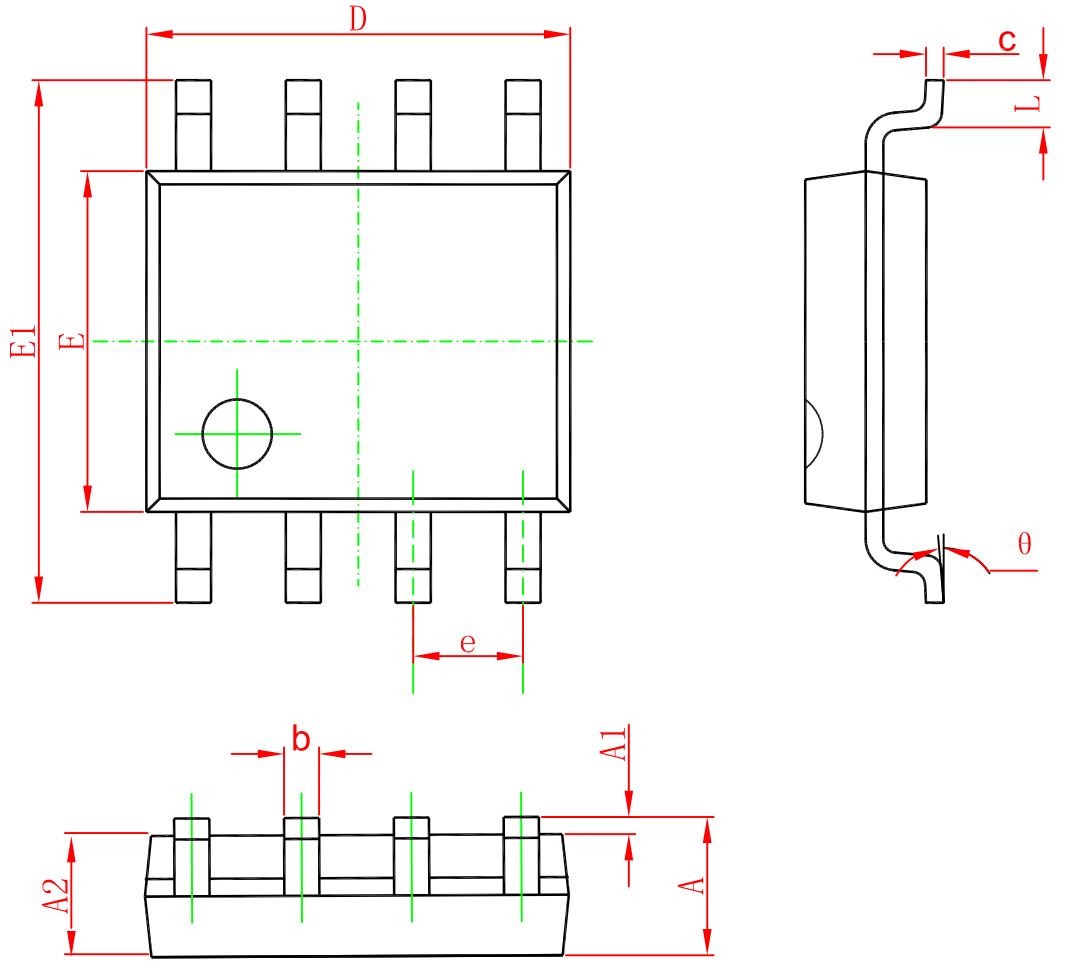


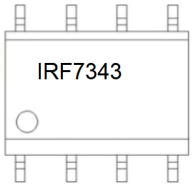
Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
IRF7343TR	SOP-8	3000	Tape and reel