

1.Features

- $V_{DS(V)}=30V$
- $I_D=16A$
- $R_{DS(ON)}<6.5m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<7.5m\Omega(V_{GS}=4.5V)$

3.Benefits

- Very Low $R_{DS(ON)}=4.5V V_{GS}$
- Low Charge and Low Gate Impedance to Reduce Switching Losses

2.Applications

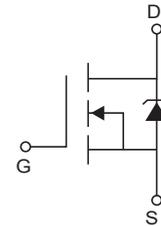
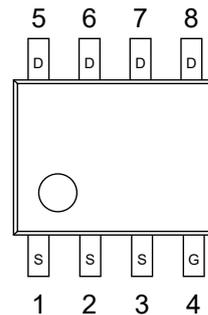
- High Frequency DC-DC Converters with Synchronous Rectification
- Lead-Free

- Fully Characterized Avalanche Voltage and Current

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 $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter		Symbol	Rating	Units
Drain- Source Voltage		V_{DS}	30	V
Gate-to-Source Voltage		V_{GS}	± 12	A
Continuous Drain Current, $V_{GS}=10\text{V}$	$T_A=25^\circ\text{C}$	I_D	16	A
Continuous Drain Current, $V_{GS}=10\text{V}$	$T_A=70^\circ\text{C}$		13	A
Pulsed Drain Current ①		I_{DM}	130	W
Maximum Power Dissipation ③	$T_A=25^\circ\text{C}$	P_D	2.5	W
Maximum Power Dissipation ③	$T_A=70^\circ\text{C}$		1.6	mW/°C
Linear Derating Factor			0.02	V
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

6. Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ④	$R_{\theta JA}$		50	°C/W



7. Electrical Characteristics $T_J=25^\circ\text{C}$

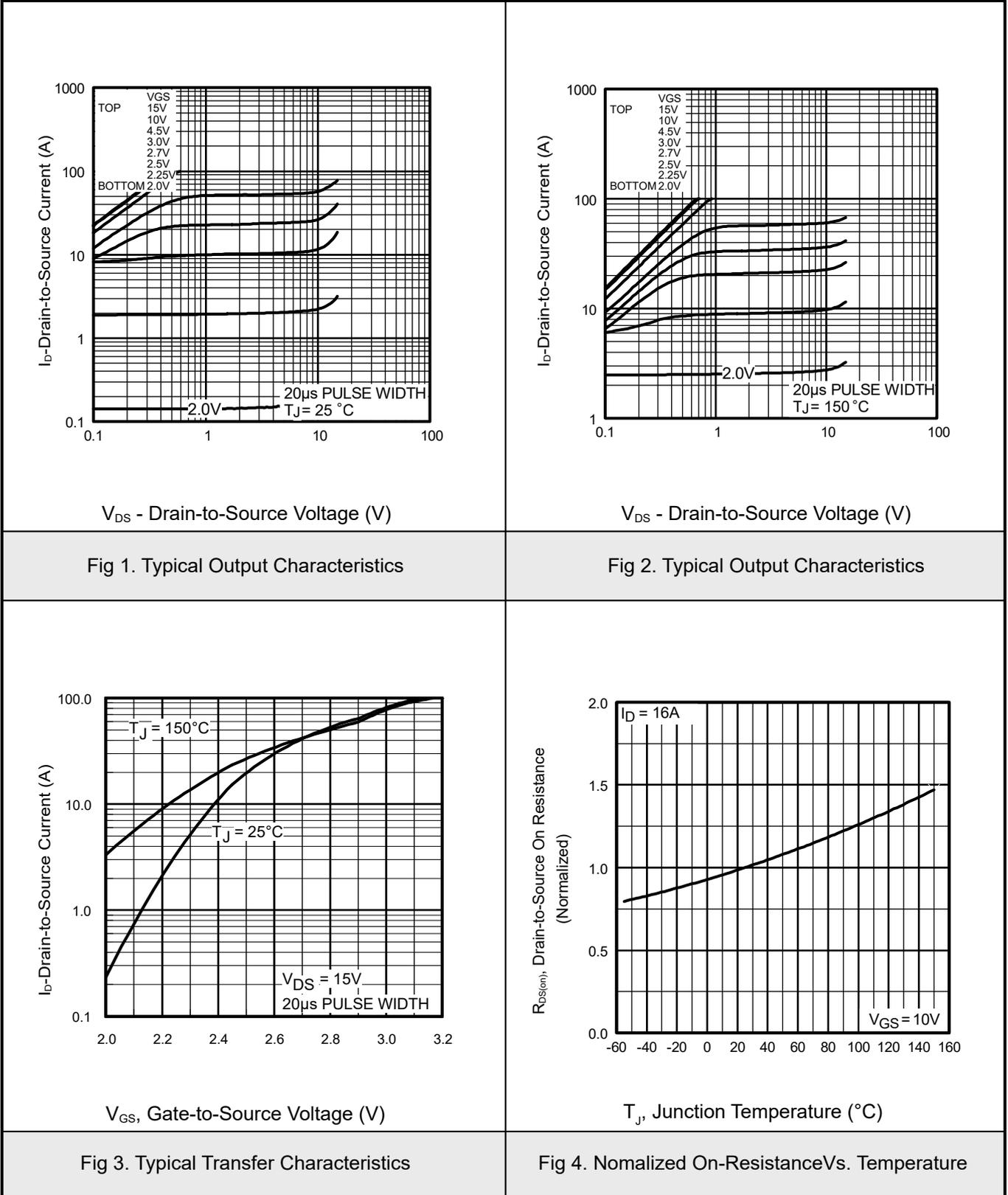
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/T_J$	$I_D=1\text{mA}$, Reference to 25°C		0.024		$\text{V}/^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=16\text{A}$ ③		4.7	6.5	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=13\text{A}$ ③		5.7	7.5	
		$V_{GS}=2.8\text{V}$, $I_D=3.5\text{A}$ ③		11	20	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	0.6		2	V
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=16\text{V}$, $V_{GS}=0\text{V}$			20	μA
		$V_{DS}=16\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^\circ\text{C}$			100	μA
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=12\text{V}$			200	nA
Gate-to-Source Reverse Leakage		$V_{GS}=-12\text{V}$			-200	nA
Dynamic						
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=16\text{V}$	44			S
Total Gate Charge	Q_g	$V_{DS}=16\text{V}$		41	62	nC
Gate-to-Source Charge	Q_{gs}	$V_{GS}=5\text{V}$ ③		9.7	15	nC
Gate-to-Drain ("Miller") Charge	Q_{gd}	$I_D=16\text{A}$		18	27	nC
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=10\text{V}$		20		ns
Rise Time	t_r	$I_D=1\text{A}$		25		ns
Turn-Off Delay Time	$t_{D(off)}$	$R_G=6\Omega$		50		ns
Fall Time	t_f	$V_{GS}=4.5\text{V}$ ③		52		ns
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		3640		pF
Output Capacitance	C_{oss}	$V_{DS}=15\text{V}$		1570		pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0\text{MHz}$		330		pF
Avalanche Characteristics						
Single Pulse Avalanche Energy ②	E_{AS}				250	mJ
Avalanche Current ①	I_{AR}				16	A
Repetitive Avalanche Energy ①	E_{AR}				0.25	mJ



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}				130	
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}	$T_J=25^\circ\text{C}, I_F=2.5\text{A}$		48	72	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt=100\text{A}/\mu\text{s}$ ③		74	110	nC

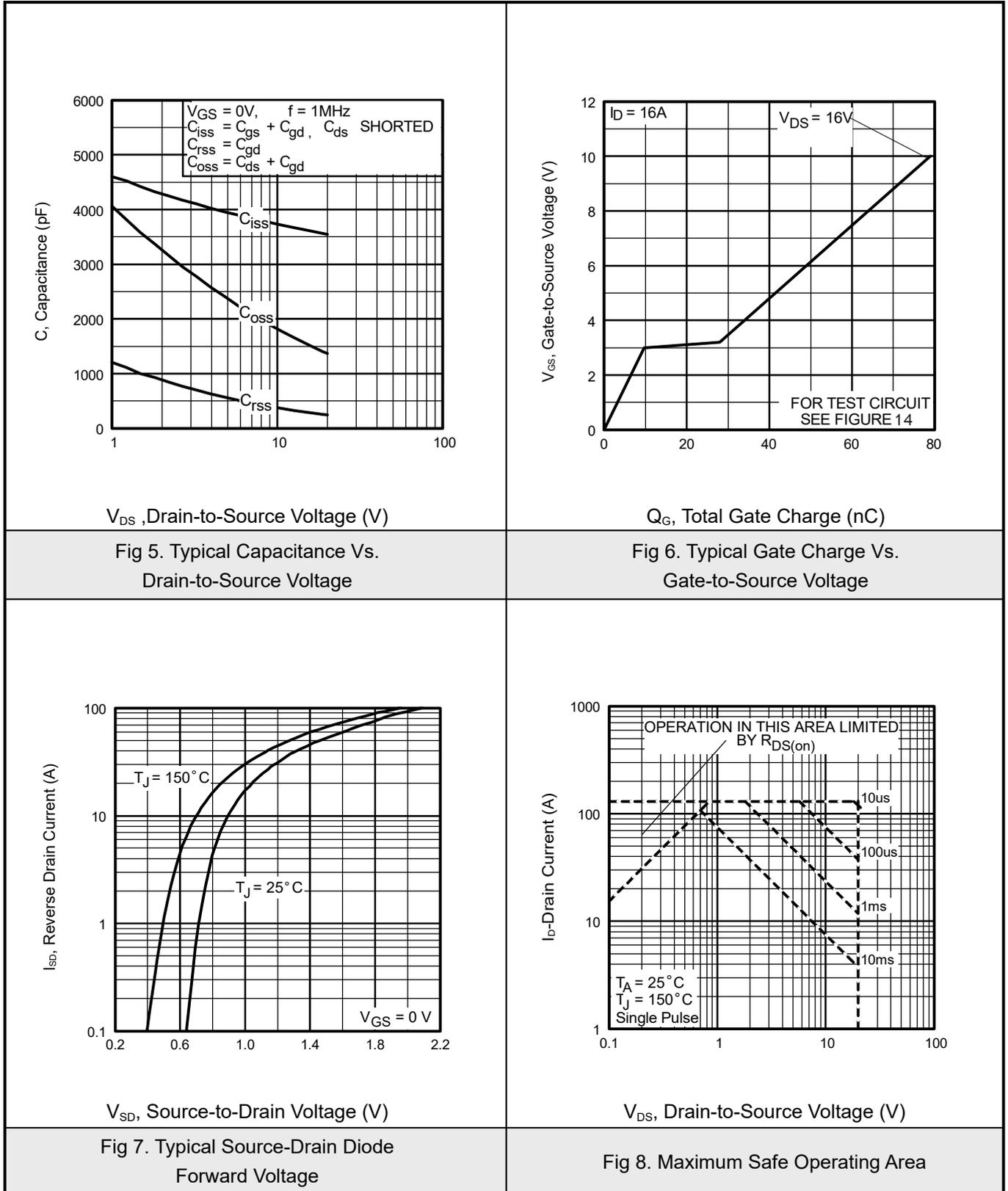


8.1 Typical Characteristics



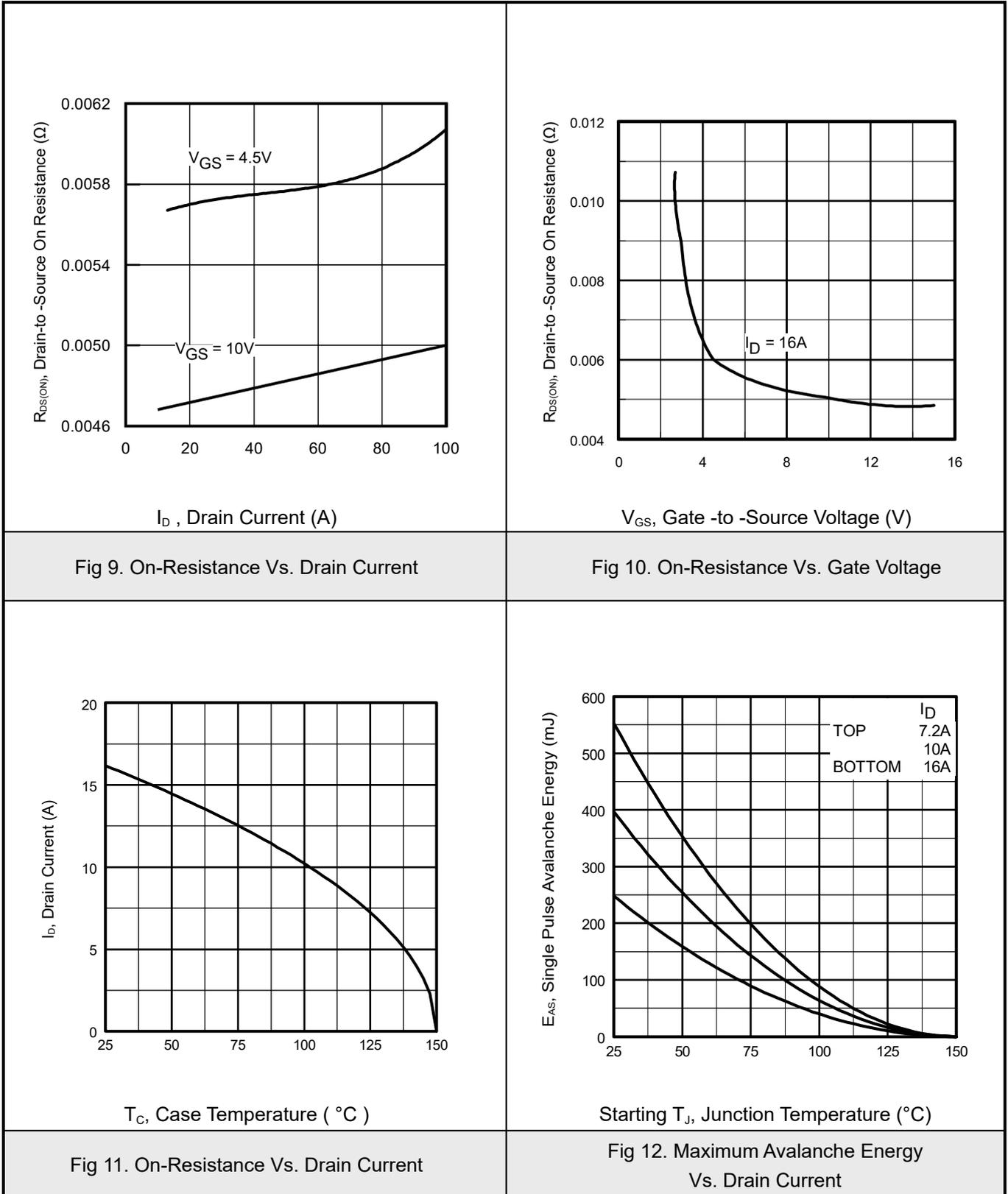


8.2 Typical Characteristics



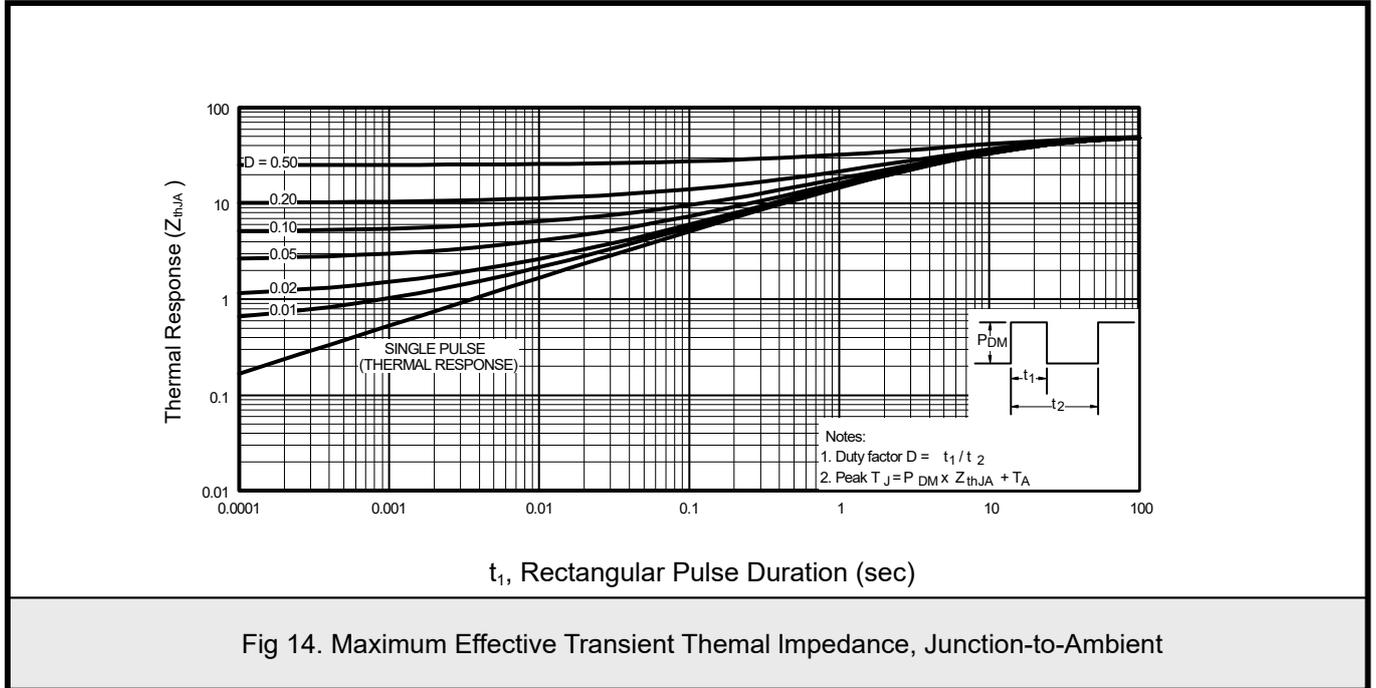


8.3 Typical Characteristics





8.4 Typical Characteristics



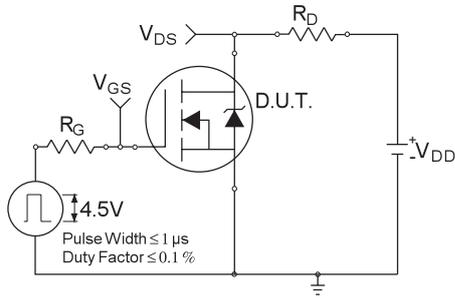


Fig 15a. Switching Time Test Circuit

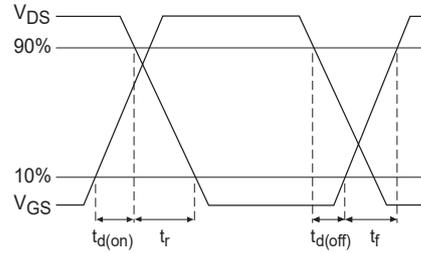


Fig 15b. Switching Time Waveforms

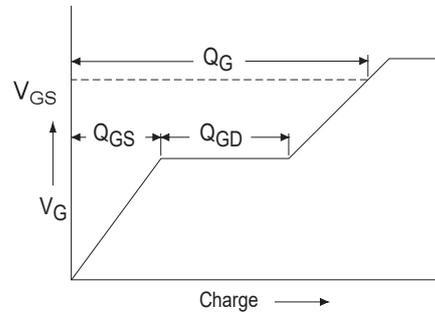
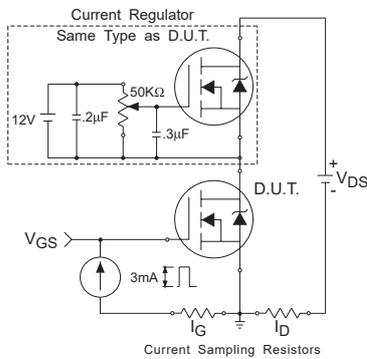


Fig 16a&b. Basic Gate Charge Test Circuit and Waveform

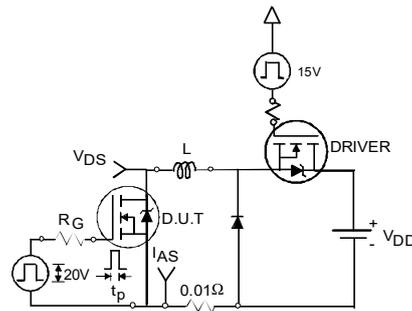
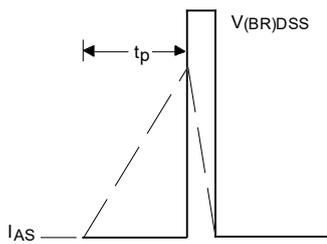
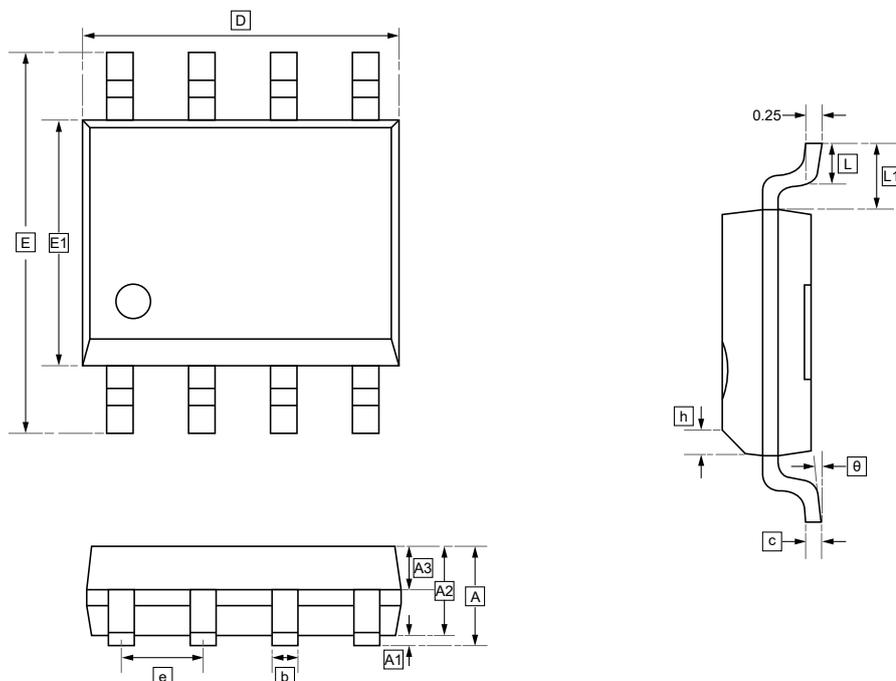


Fig 17a&b. Unclamped Inductive Test circuit and Waveforms



9.SOP-8 Package Outline Dimensions



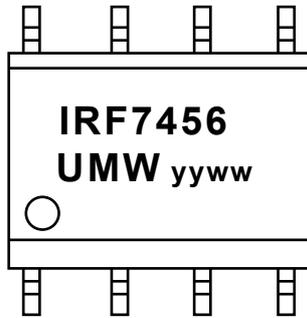
DIMENSIONS (mm are the original dimensions)

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°



10. Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF7456TR	SOP-8	3000	Tape and reel



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