

1.Description

The SOT23-6 package with its customized lead frame produces a power MOSFET with $R_{DS(ON)}$ 60% less than a similar size SOT-23. This package is ideal for applications where printed circuit board space is at a premium.

3.Applications

- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel

2.Features

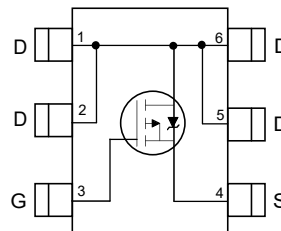
- $V_{DS(V)} = -40V$
- $I_D = -3.4A$
- $R_{DS(ON)} \leq 70m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} \leq 100m\Omega (V_{GS} = -4.5V)$

- Low Gate Charge
- Lead-Free
- Halogen-Free

4.Pinning information

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

SOT23-6



5.Absolute Maximum Ratings $T_J = 25^\circ C$ unless otherwise noted

Parameter		Symbol	Rating	Units
Drain- Source Voltage		V_{DS}	-40	V
Continuous Drain Current, $V_{GS} = -10V$	$T_A = 25^\circ C$	I_D	-3.4	A
Continuous Drain Current, $V_{GS} = -10V$	$T_A = 70^\circ C$		-2.7	A
Pulsed Drain Current ①		I_{DM}	-27	A
Maximum Power Dissipation ③	$T_A = 25^\circ C$	P_D	2	W
Maximum Power Dissipation ③	$T_A = 70^\circ C$		1.3	W



Linear Derating Factor		16	mW/°C
Gate-to-Source Voltage	V _{GS}	±20	V
Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

6.Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Ambient ③	R _{θJA}		62.5	°C/W



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-40			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/\Delta T_J$	$I_D=-1\text{mA}$, Reference to 25°C		-0.03		V/ $^{\circ}\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-3.4\text{A}$			70	m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-2.7\text{A}$			100	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1		-3	V
Forward Transconductance	g_{FS}	$V_{GS}=-10\text{V}$, $I_D=-3.4\text{A}$	4			S
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=-32\text{V}$, $V_{GS}=0\text{V}$			-10	μA
		$V_{DS}=-32\text{V}$, $V_{GS}=0\text{V}$, $T_J=150^{\circ}\text{C}$			-25	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=-20\text{V}$			-100	nA
Gate-to-Source Reverse Leakage		$V_{GS}=20\text{V}$			100	
Total Gate Charge	Q_g	$I_D=-3.4\text{A}$		25	37	nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-20\text{V}$		4.5	6.8	
Gate-to-Drain ("Miller") Charge	Q_{gd}	$V_{GS}=-10\text{V}$		3.5	5.3	
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=-20\text{V}$ ②		43		ns
Rise Time	t_r	$I_D=-1\text{A}$		550		
Turn-Off Delay Time	$t_{D(off)}$	$R_G=6\Omega$		88		
Fall Time	t_f	$V_{GS}=-10\text{V}$		50		
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		1110		pF
Output Capacitance	C_{oss}	$V_{DS}=-25\text{V}$		93		
Reverse Transfer Capacitance	C_{rss}	$f=100\text{KHz}$		73		



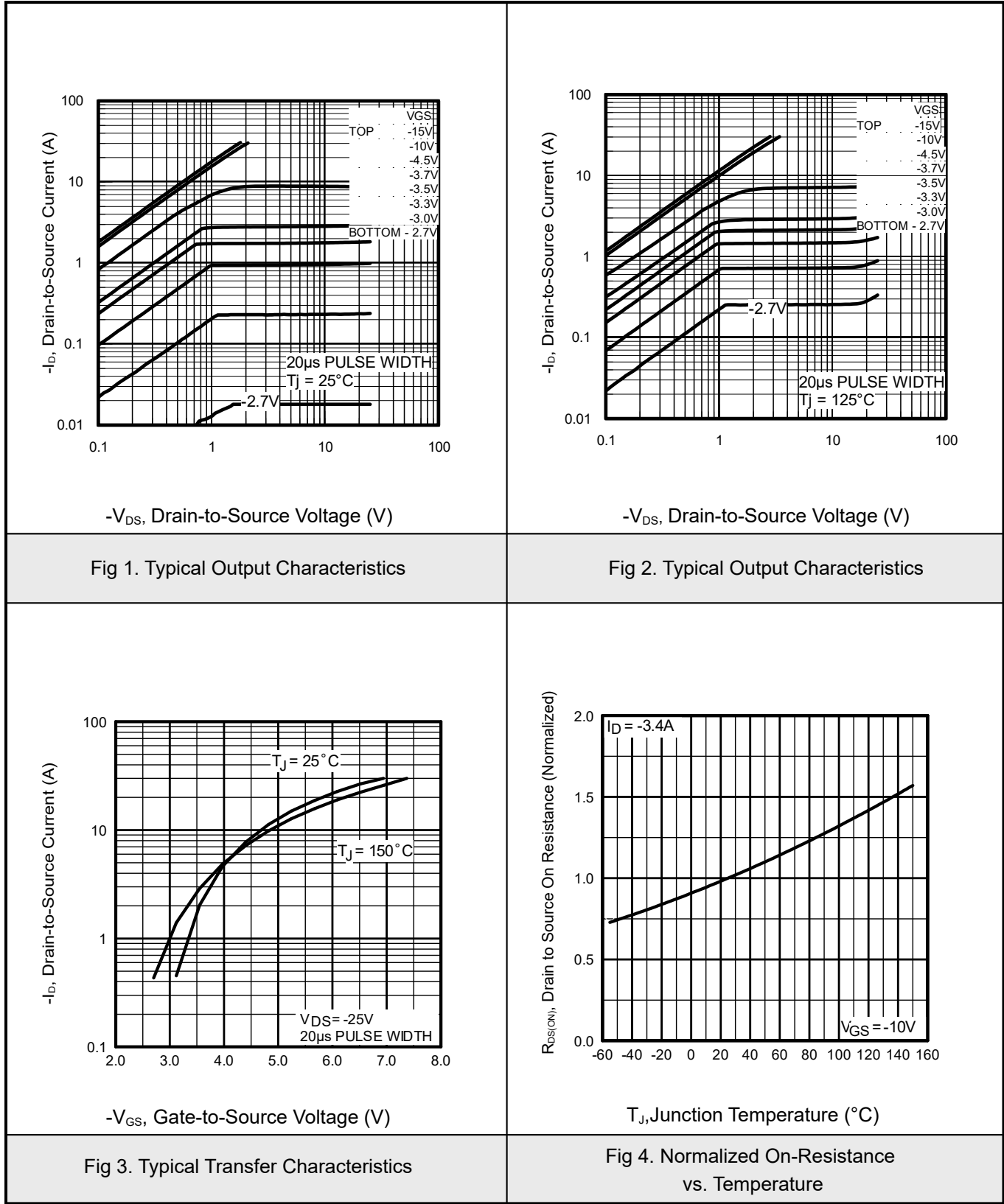
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-2	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-27	
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}\text{C}, I_S=2\text{A}, V_{GS}=0\text{V}$ ②			-1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}\text{C}, I_F=-2\text{A}$ $dI/dt=100\text{A}/\mu\text{s}$ ②		27	40	ns
Reverse Recovery Charge	Q_{rr}			34	50	nC

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ③ Surface mounted on 1 in square Cu board.

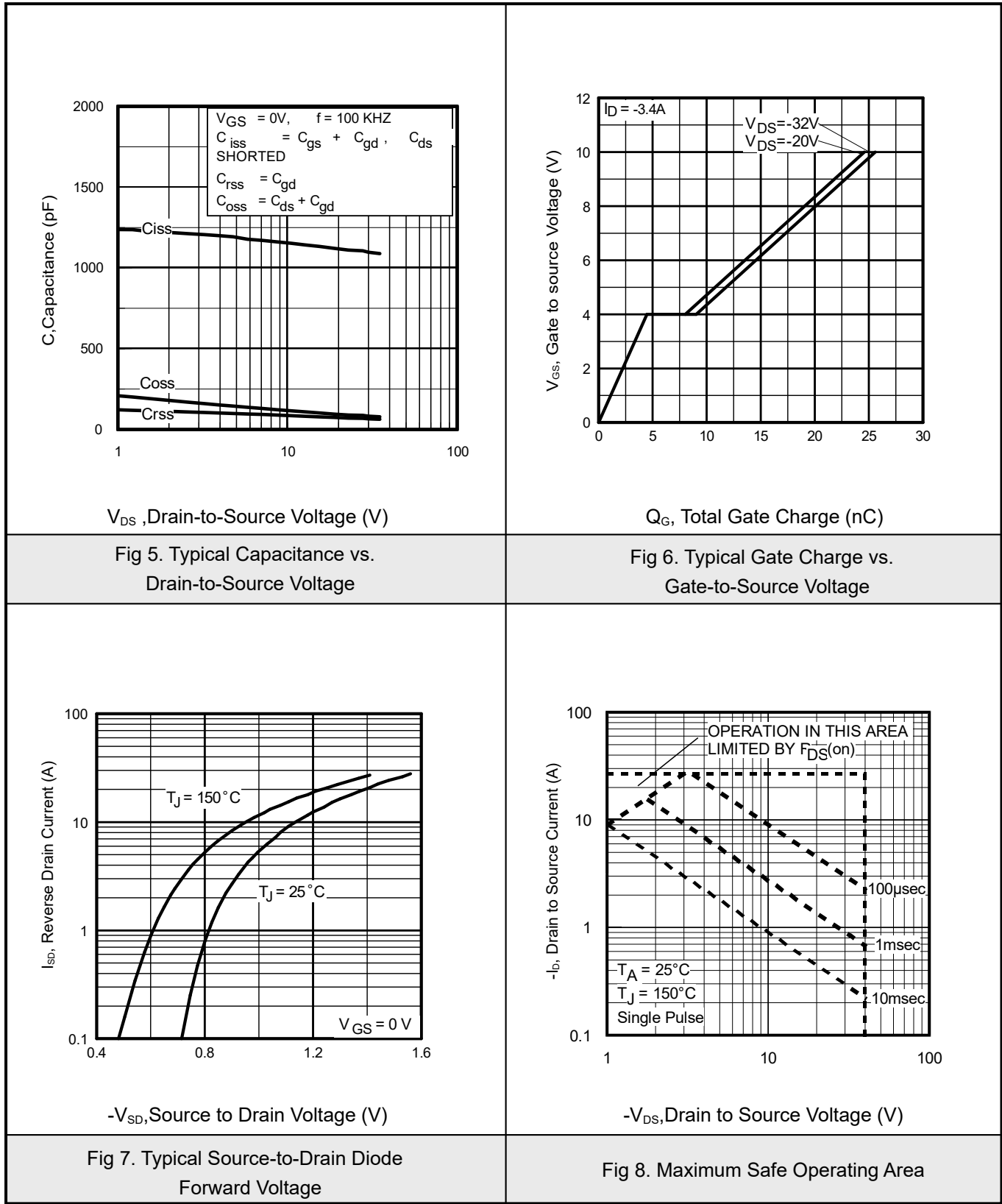


8.1Typical Characterisitics



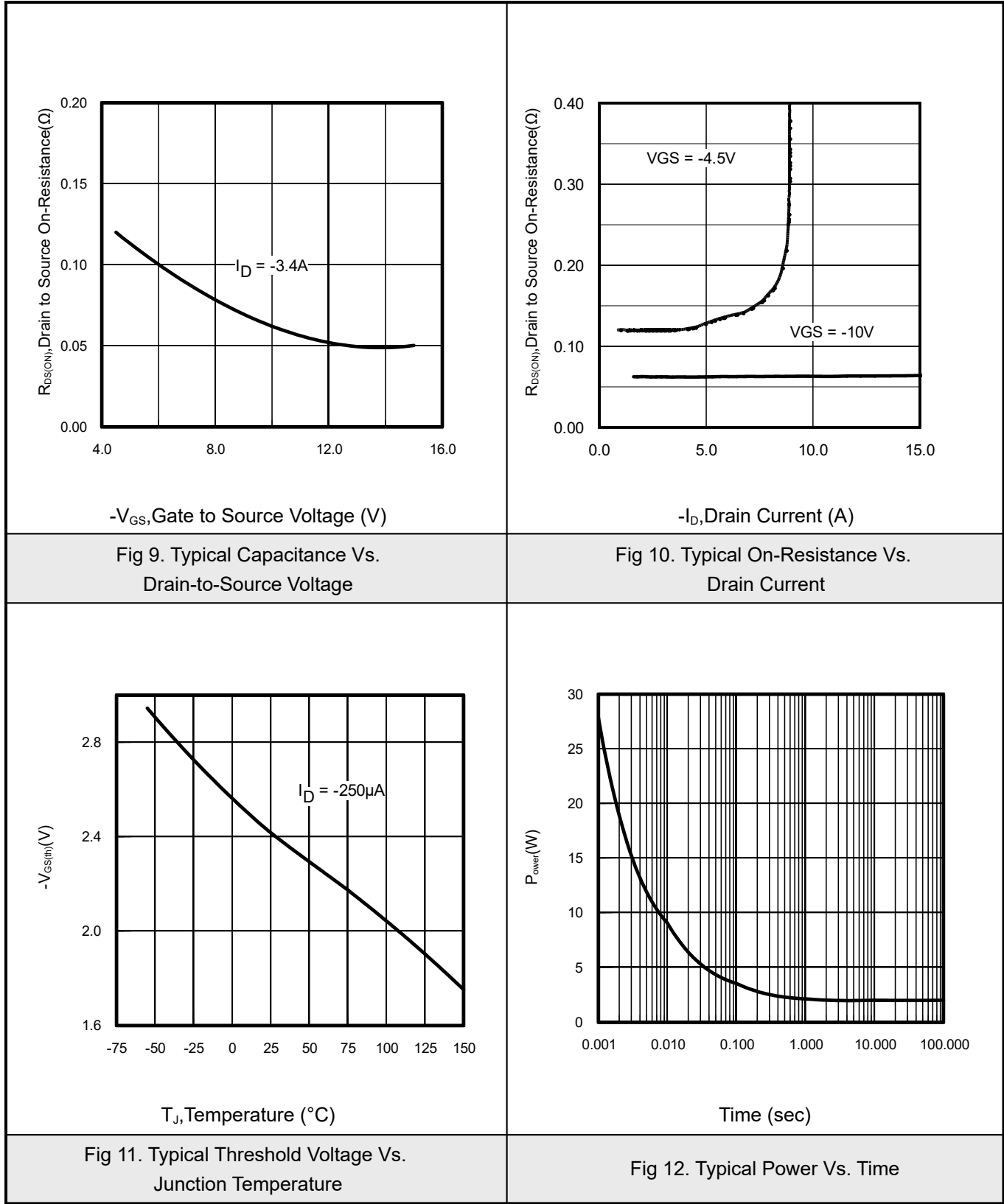


8.2Typical Characteristics





8.3Typical Characterisitics





8.4 Typical Characteristics

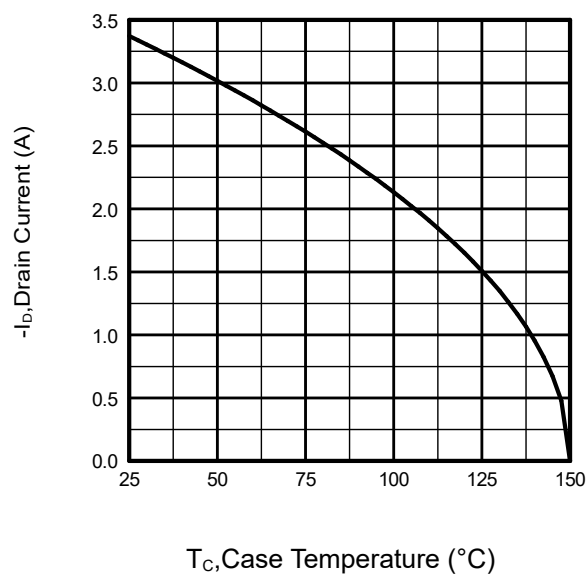


Fig 13. Maximum Drain Current vs. Case Temperature

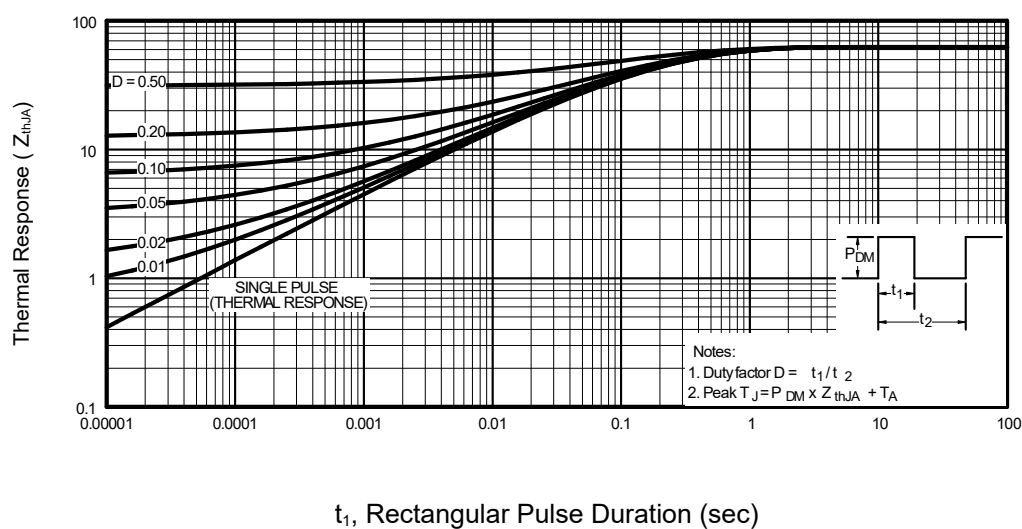


Fig 14. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



8.5Typical Characterisitics

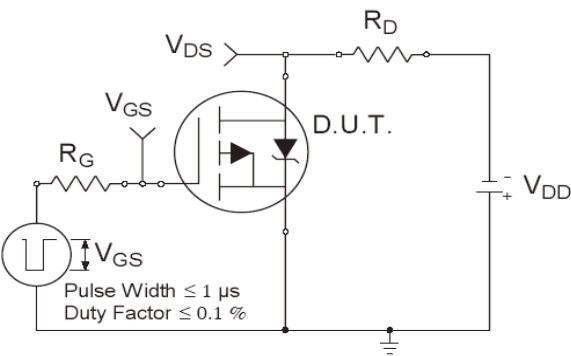


Fig 15a. Switching Time Test Circuit

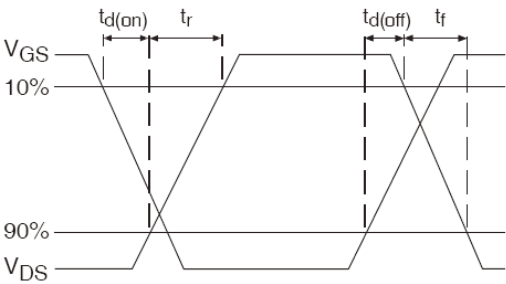


Fig 15b. Switching Time Waveforms

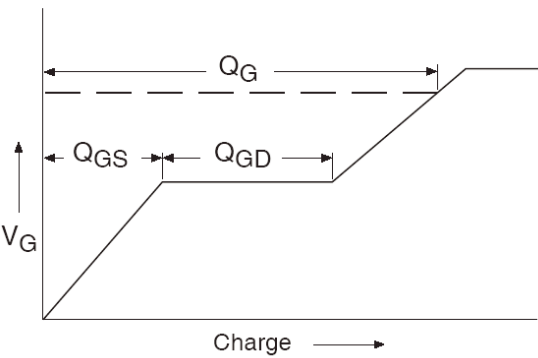


Fig 16a. Basic Gate Charge Waveform

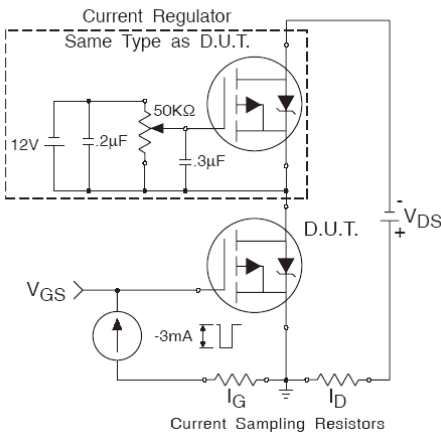
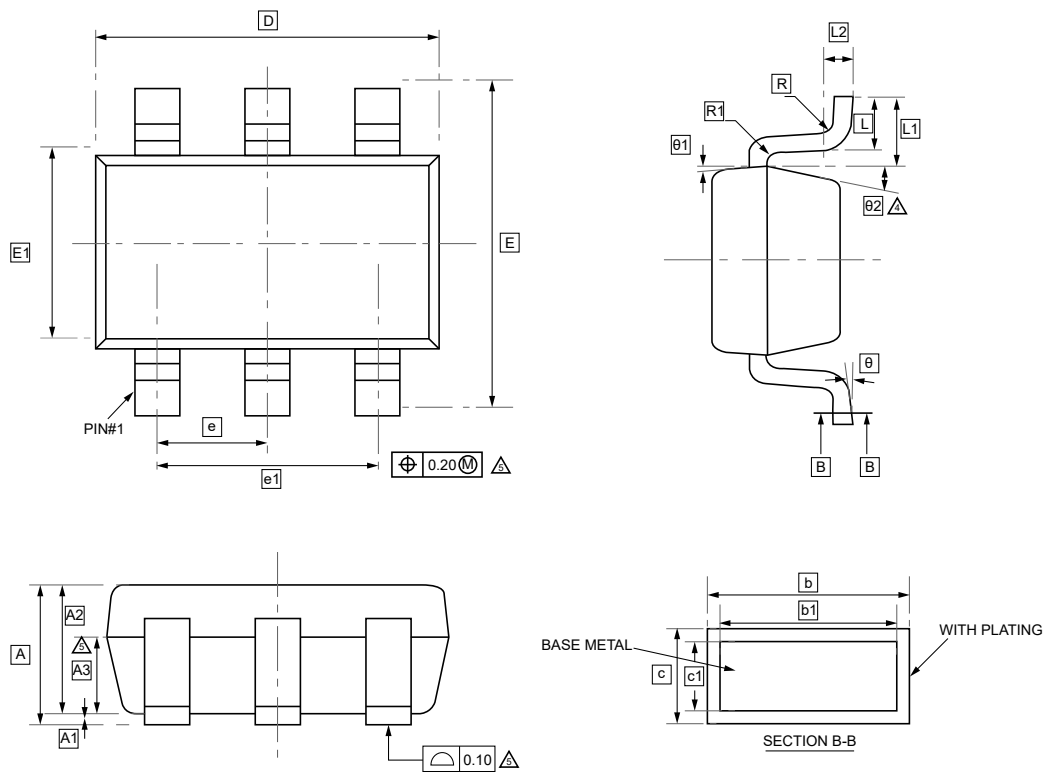


Fig 16b. Gate Charge Test Circuit



9.SOT23-6 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

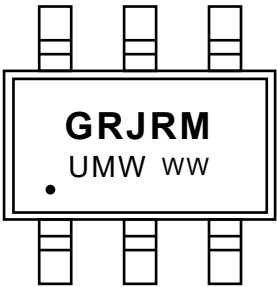
Symbol	A	A1	A2	A3	b	b1	c	c1	D	E	E1	e	e1	L	L1	L2
Min		0	1.00	0.60	0.36	0.36	0.14	0.14	2.826	2.60	1.526	0.90	1.80	0.35	0.59	0.25
Max	1.25	0.15	1.20	0.70	0.50	0.45	0.16	0.16	3.026	3.00	1.726	1.00	2.00	0.60	REF	BSC

Symbol	R	R1	θ	θ_1	θ_2
Min	0.10	0.10	0°	3°	6°
Max		0.20	8°	7°	14°





10.Ordering information



ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF5803TR	SOT23-6	3000	Tape and reel



11.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.