

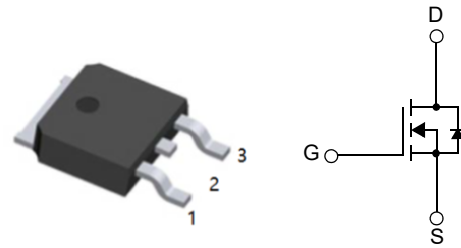
## 1.Features

- $V_{DS(V)}=30V$
- $I_D=50A$
- $R_{DS(ON)}<5m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<7.3m\Omega(V_{GS}=4.5V)$

## 2.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)  
top view



## 3.Absolute Maximum Ratings $T_C=25^\circ C$

Parameter	Symbol	Conditions	Rating	Units
Continuous drain current	$I_D$	$V_{GS}=10V, T_C=25^\circ C$	50	A
		$V_{GS}=10V, T_C=100^\circ C$	50	A
		$V_{GS}=4.5V, T_C=25^\circ C$	50	A
		$V_{GS}=4.5V, T_C=25^\circ C$	50	A
Pulsed drain current <sup>2)</sup>	$I_{D,pulse}$	$T_C=25^\circ C$	350	A
Avalanche energy, single pulse <sup>3)</sup>	$I_{AS}$	$T_C=25^\circ C$	50	A
Avalanche energy, single pulse	$E_{AS}$	$I_D=35A, R_{GS}=25\Omega$	60	mJ
Reverse diode dv/dt	dv/dt	$I_D=50A, V_{DS}=24V$ $di/dt=200 A/\mu s, T_{j,max}=175^\circ C$	6	kV/ $\mu s$
Gate source voltage	$V_{GS}$		$\pm 20$	V
Power dissipation	$P_{tot}$	$T_C=25^\circ C$	68	W
Operating and storage temperature	$T_J, T_{STG}$		-55 to 175	$^\circ C$
IEC climatic category; DIN IEC 68-1			55/175/56	



#### 4. Electrical Characteristic ( $T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units	
Thermal resistance, junction -case	$R_{thJC}$				2.2	K/W	
SMD version, device on PCB	$R_{thJA}$	minimal footprint			75	K/W	
		6 cm <sup>2</sup> cooling area <sup>4)</sup>			50	K/W	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	30			V	
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		2.2	V	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$		0.1	1	$\mu A$	
		$V_{DS}=30V, V_{GS}=0V, T_J=125^\circ\text{C}$		10	100	$\mu A$	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=20V, V_{DS}=0V$		10	100	nA	
Drain-source on-state resistance <sup>5)</sup>	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=30A$		5.8	7.3	m $\Omega$	
		$V_{GS}=10V, I_D=30A$		4.2	5	m $\Omega$	
Gate resistance	$R_G$			1.5		$\Omega$	
Transconductance	$g_{FS}$	$ V_{DS} >2 I_D R_{DS(ON)max}, I_D=30A$	38	77		S	
Input capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=15V, f=1MHz$		2400	3200	pF	
Output capacitance	$C_{oss}$			920	1200	pF	
Reverse transfer capacitance	$C_{rss}$			49		pF	
Turn-on delay time	$t_{D(on)}$	$V_{DD}=15V, V_{GS}=10V$ $I_D=30A, R_G=1.6\Omega$		6.7		ns	
Rise time	$t_r$			13		ns	
Turn-off delay time	$t_{D(off)}$			25		ns	
Fall time	$t_f$			3.8		ns	
Gate to source charge	$Q_{gs}$				7.4		nC
Gate charge at threshold	$Q_{g(th)}$	$V_{DD}=15V, I_D=30A$ $V_{GS}=0$ to 4.5V		3.8		nC	
Gate to drain charge	$Q_{gd}$			3.5		nC	
Switching charge	$Q_{SW}$			7.1		nC	
Gate charge total	$Q_g$			15	20	nC	
Gate plateau voltage	$V_{plateau}$				3.1		V



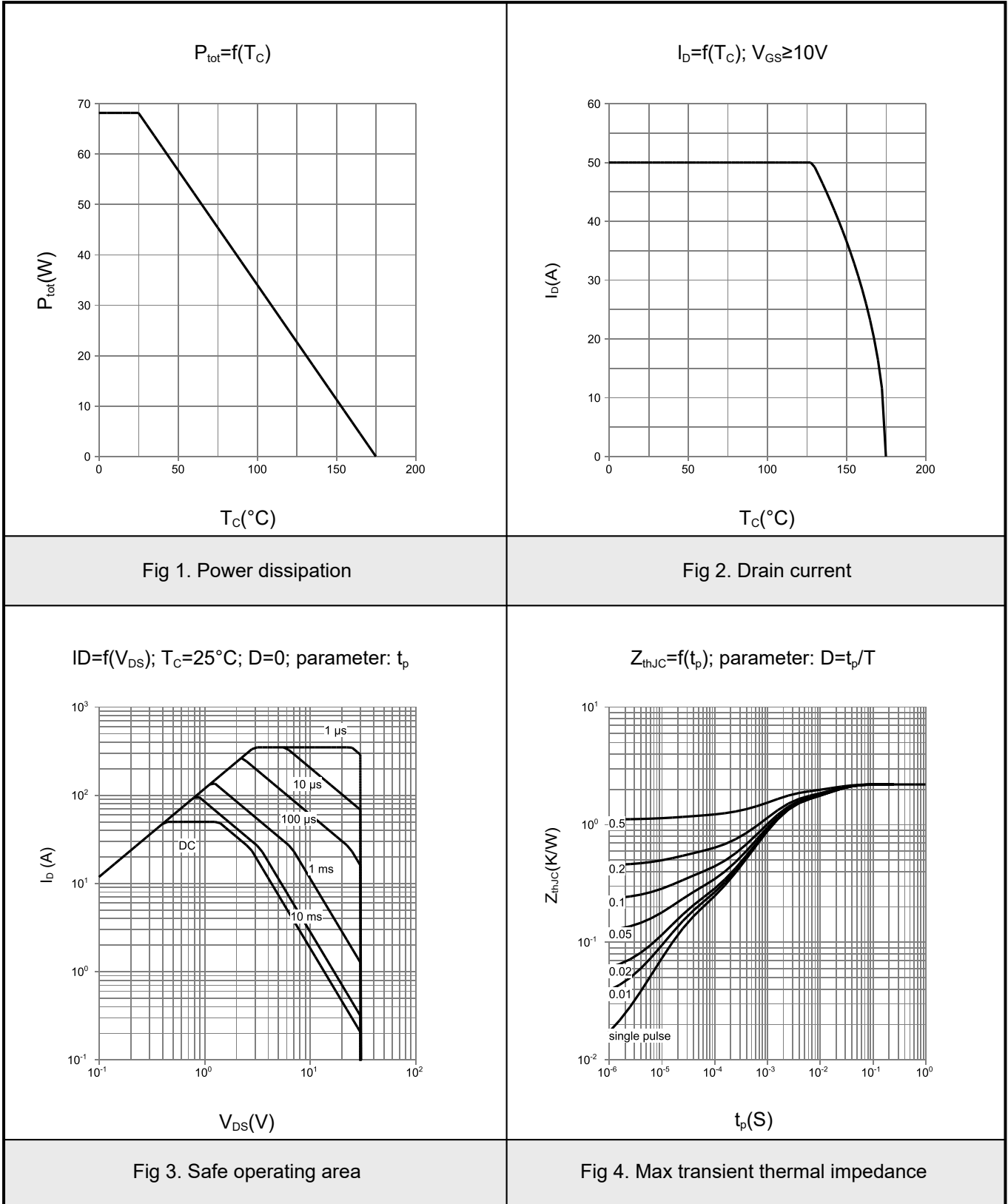
Gate charge total	$Q_g$	$V_{DD}=50V, I_D=30A, V_{GS}=0$ to 10V	31		nC
Gate charge total, sync.FET	$Q_{g(sync)}$	$V_{DS}=0.1V, V_{GS}=0$ to 4.5V	13	17	nC
Output charge	$Q_{oss}$	$V_{DD}=15V, V_{GS}=0V$	24		nC
Diode continuous forward current	$I_S$	$T_C=25^\circ C$		50	A
Diode pulse current	$I_{S,pulse}$			350	A
Diode forward voltage	$V_{SD}$	$V_{GS}=0V, I_F=30A, T_J=25^\circ C$	0.86	1.1	V
Reverse recovery charge	$Q_{rr}$	$V_R=15V, I_F=I_S, di_F/dt=400A/\mu s$		15	nC

Notes:

6) See figure 16 for gate charge parameter definition.

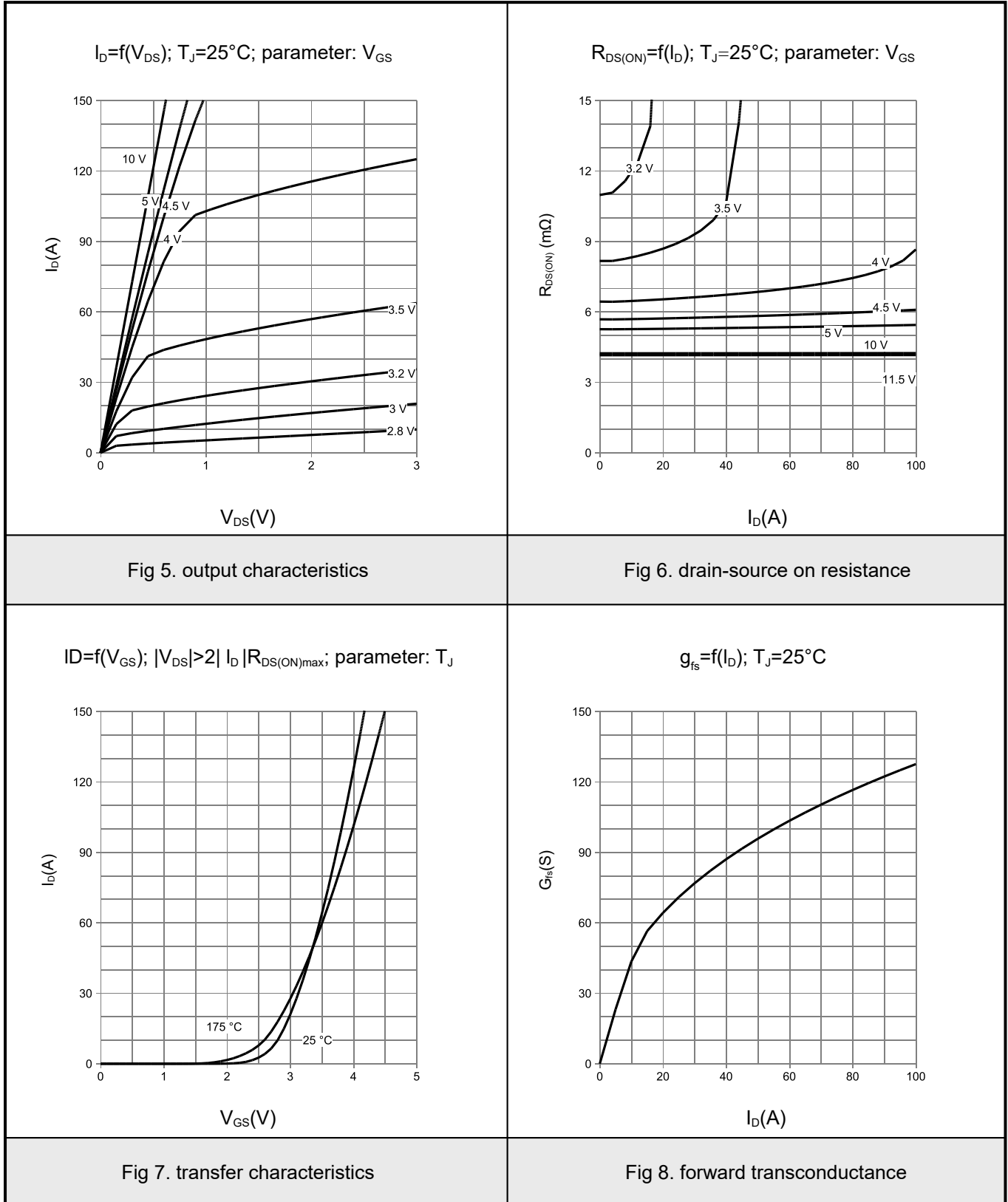


### 5.1 Typical characteristic



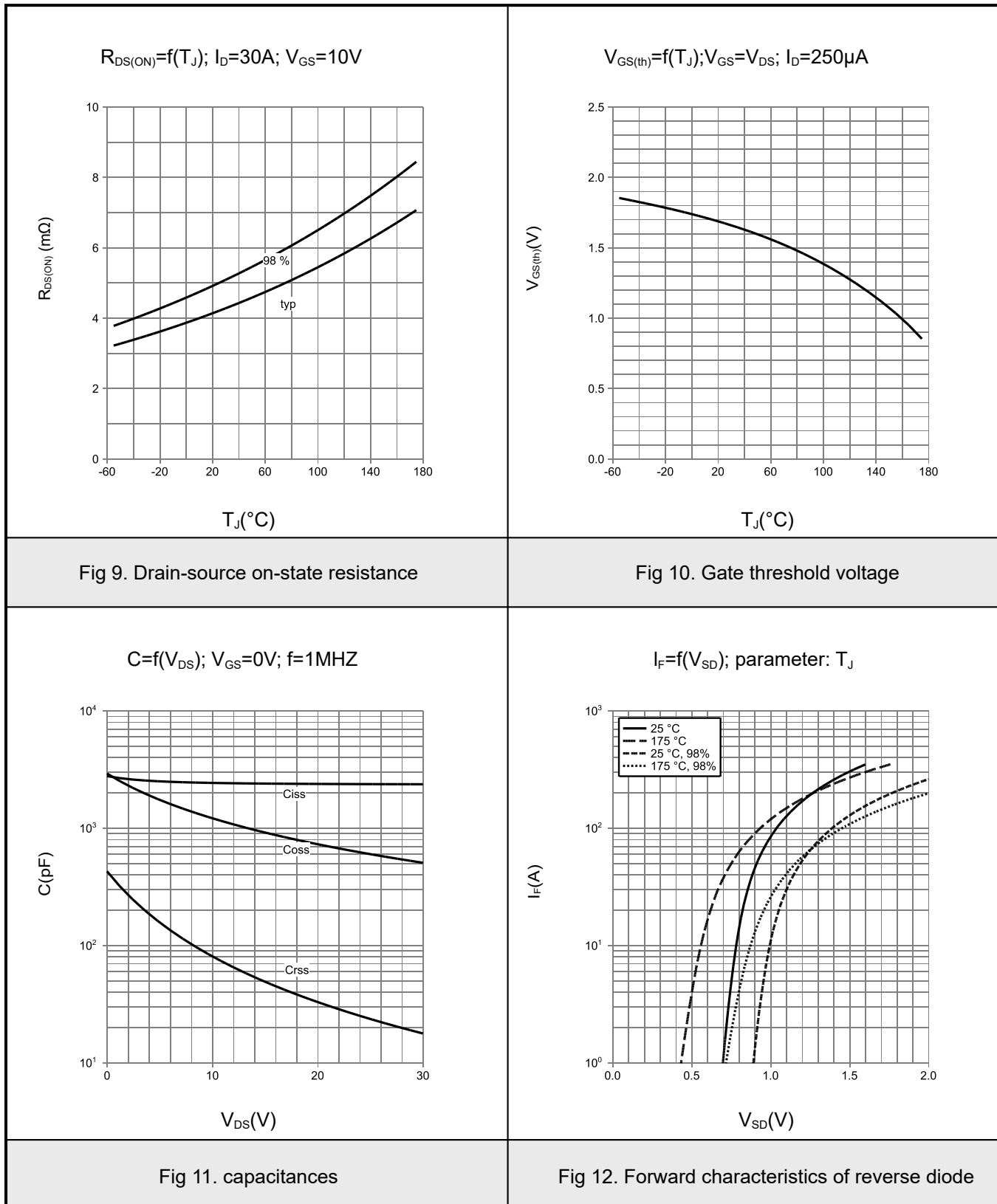


### 5.2 Typical characteristic





## 5.3 Typical characteristic



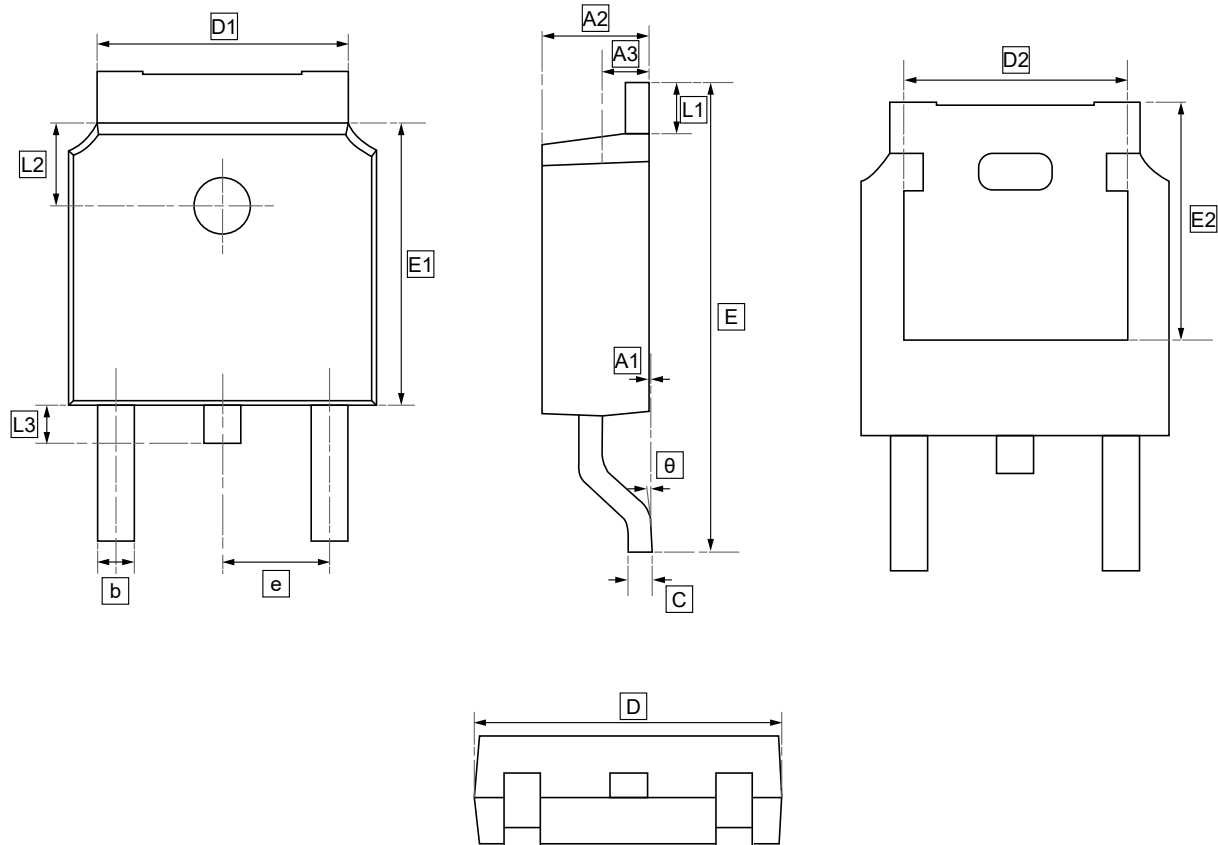


### 5.4 Typical characteristic

<p><math>I_{AS}=f(t_{AV}); R_{GS}=25\Omega; \text{parameter: } T_{J(\text{start})}</math></p> <p style="text-align: center;"><math>T_{AV}(\mu s)</math></p>	<p><math>V_{GS}=f(Q_{gate}); I_D=30A \text{ pulsed}; \text{parameter: } V_{DD}</math></p> <p style="text-align: center;"><math>Q_{gate}(nC)</math></p>
<p>Fig 13. Avalanche characteristics</p>	<p>Fig 14. gate charge</p>
<p><math>V_{BR(DSS)}=f(T_J); I_D=1m A</math></p> <p style="text-align: center;"><math>T_J(^\circ C)</math></p>	
<p>Fig 15. drain source breakdown voltage</p>	<p>Fig 16. Gate charge waveforms</p>



## 6.TO-252 Package Outline Dimensions

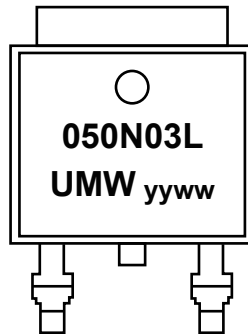


### DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
<b>Min</b>	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
<b>Max</b>	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00



## 7. Ordering information



yy: Year Code  
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IPD050N03LGATMA1	TO-252	2500	Tape and reel



## **8.Disclaimer**

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