

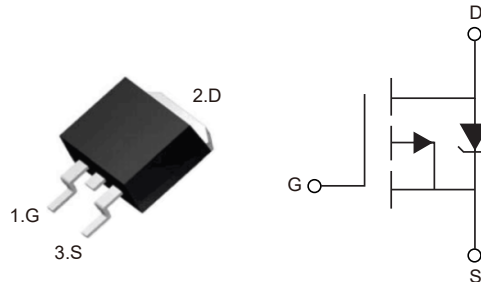
1.Features

- $V_{DS(V)} = -55V$
- $I_D = -31A$
- $R_{DS(ON)} < 60m\Omega (V_{GS} = -10V)$

2.Pinning information

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

TO-263



3.Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Continuous Drain Current, $V_{GS} = -10V$ ⑤	$T_C = 25^\circ C$	I_D	-31	A
Continuous Drain Current, $V_{GS} = -10V$ ⑤	$T_C = 100^\circ C$		-22	A
Pulsed Drain Current ①⑤		I_{DM}	-110	A
Power Dissipation		P_D	110	W
Linear Derating Factor			0.71	W/ $^\circ C$
Gate-to-Source Voltage		V_{GS}	± 20	V
Single Pulse Avalanche Energy ②⑤		E_{AS}	280	mJ
Avalanche Current ①		I_{AR}	-16	A
Repetitive Avalanche Energy ①		E_{AR}	11	mJ
Peak Diode Recovery dv/dt ③⑤		dv/dt	-5.8	V/ns
Storage Temperature Range		T_J, T_{STG}	-55 to 175	$^\circ C$
Soldering Temperature, for 10 seconds			300 (1.6mm from case)	$^\circ C$



4. Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Case	$R_{\theta JC}$		1.4	$^{\circ}\text{C/W}$
Junction-to-Ambient (PCB Mounted, steady-state) **	$R_{\theta JA}$		40	$^{\circ}\text{C/W}$

5. Electrical Characteristics @ $T_J = 25^{\circ}\text{C}$ (unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$	-55			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS} / \Delta T_J$	$I_D = -1\text{mA}$, Reference to 25°C		-0.034		$\text{V}/^{\circ}\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = -10\text{V}$, $I_D = -16\text{A}$ ④			60	$\text{m}\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$	-1.1	-2	-3	V
Forward Transconductance	g_{FS}	$V_{DS} = -25\text{V}$, $I_D = -16\text{A}$ ⑤	8			S
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS} = -55\text{V}$, $V_{GS} = 0\text{V}$			-25	μA
		$V_{DS} = -44\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 150^{\circ}\text{C}$			-250	μA
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	nA
Total Gate Charge	Q_g	$I_D = -16\text{A}$			63	nC
Gate-to-Source Charge	Q_{gs}	$V_{DS} = -44\text{V}$, $V_{GS} = -10\text{V}$			13	nC
Gate-to-Drain ("Miller") Charge	Q_{gd}	See Fig.6 and 13 ④⑤			29	nC
Turn-On Delay Time	$t_{D(on)}$	$V_{DD} = -28\text{V}$, $I_D = -16\text{A}$ $R_G = 6.8\Omega$, $R_D = 1.6\Omega$ See Fig.10 ④⑤		14		ns
Rise Time	t_r			66		ns
Turn-Off Delay Time	$t_{D(off)}$			39		ns
Fall Time	t_f			63		ns
Internal Drain inductance	L_S	Between lead, and center of die contact		7.5		nH
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = -25\text{V}$ $f = 1\text{MHz}$, See Fig. 5 ⑤		1200		pF
Output Capacitance	C_{oss}			520		pF
Reverse Transfer Capacitance	C_{rss}			250		pF



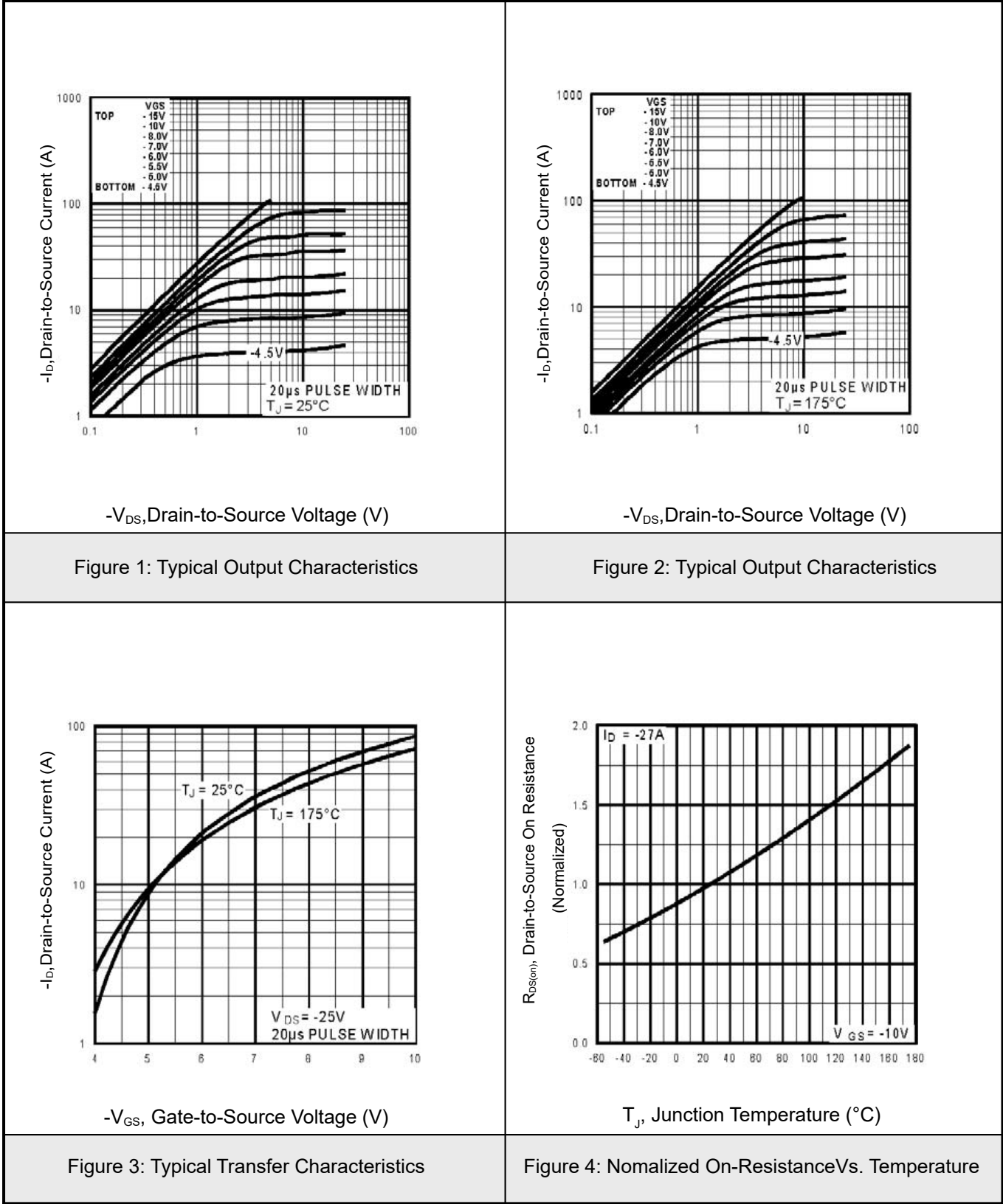
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-31	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-110	
Diode Forward Voltage	V_{SD}	$T_J=25^\circ\text{C}$, $I_S=-16\text{A}$, $V_{GS}=0\text{V}$ ④			-1.3	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}$, $I_F=-16\text{A}$ $di/dt=100\text{A}/\mu\text{s}$ ④⑤		71	110	ns
Reverse Recovery Charge	Q_{rr}			170	250	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.(See fig.11)
- ② $V_{DD}=-25\text{V}$, Starting $T_J=25^\circ\text{C}$, $L=2.1\text{mH}$, $R_G=25\Omega$, $I_{AS}=-16\text{A}$.(See figure.12)
- ③ $I_{SD} \leq -16\text{A}$, $di/dt \leq 280\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175^\circ\text{C}$.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ Uses IRF5305 data and test conditions.

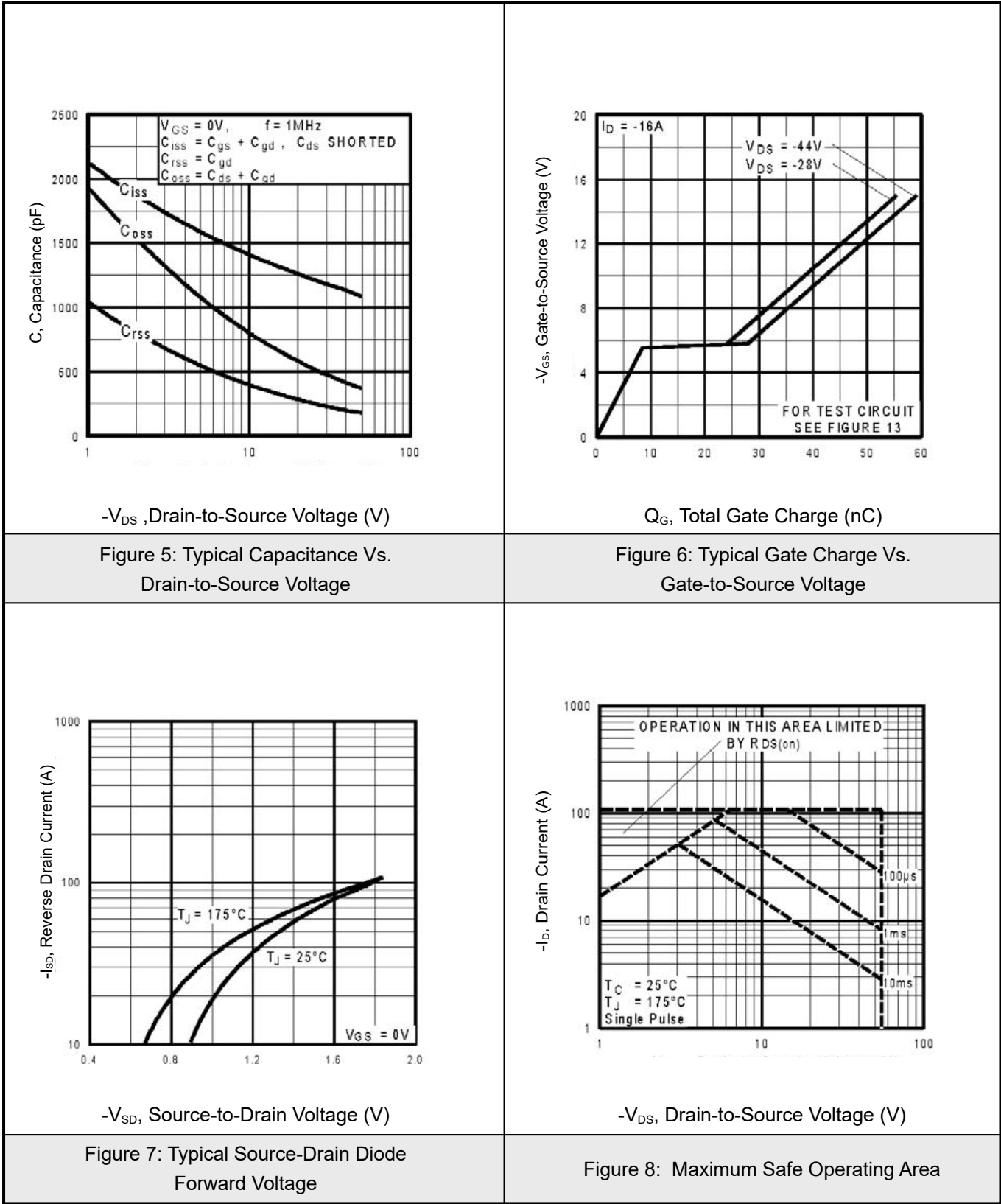


6.1 Typical Characteristics



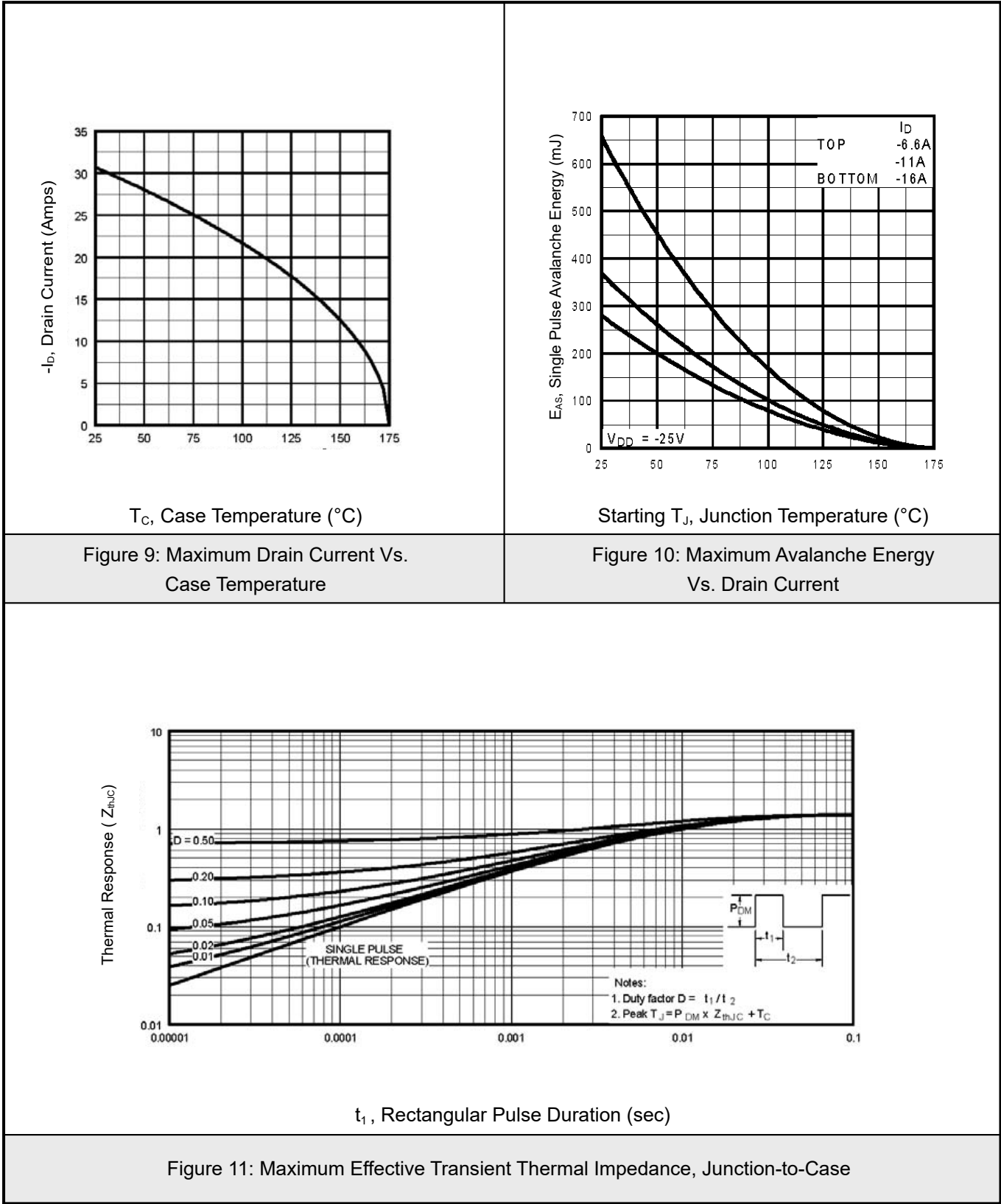


6.2Typical Characteristics





6.3Typical Characterisitics





6.4 Typical Characteristics

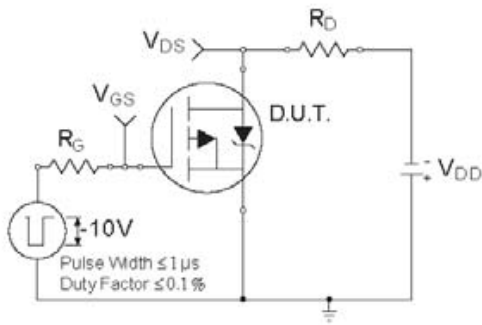


Figure 12a: Switching Time Test Circuit

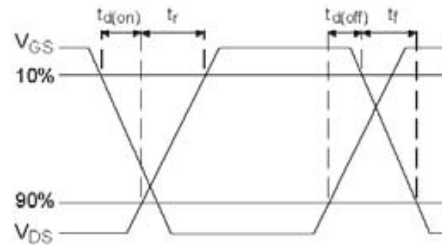


Figure 12b: Switching Time Waveforms

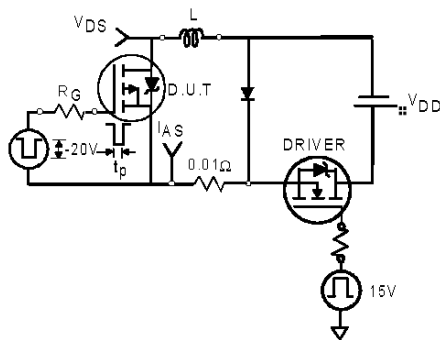


Figure 13a: Unclamped Inductive Test Circuit

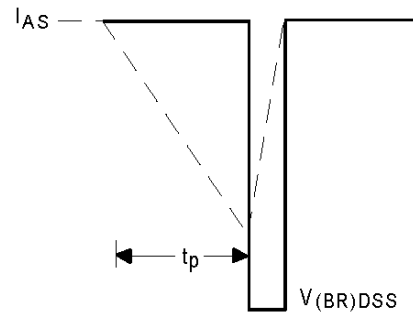


Figure 13b: Unclamped Inductive Waveforms

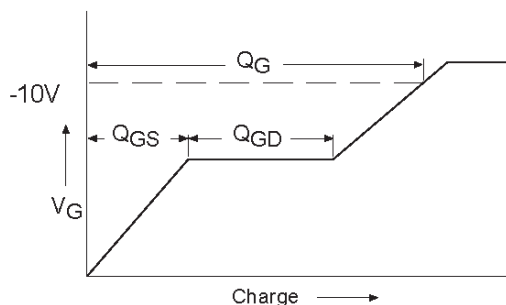


Figure 14a: Basic Gate Charge Waveform

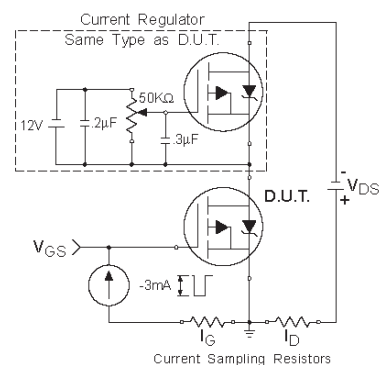
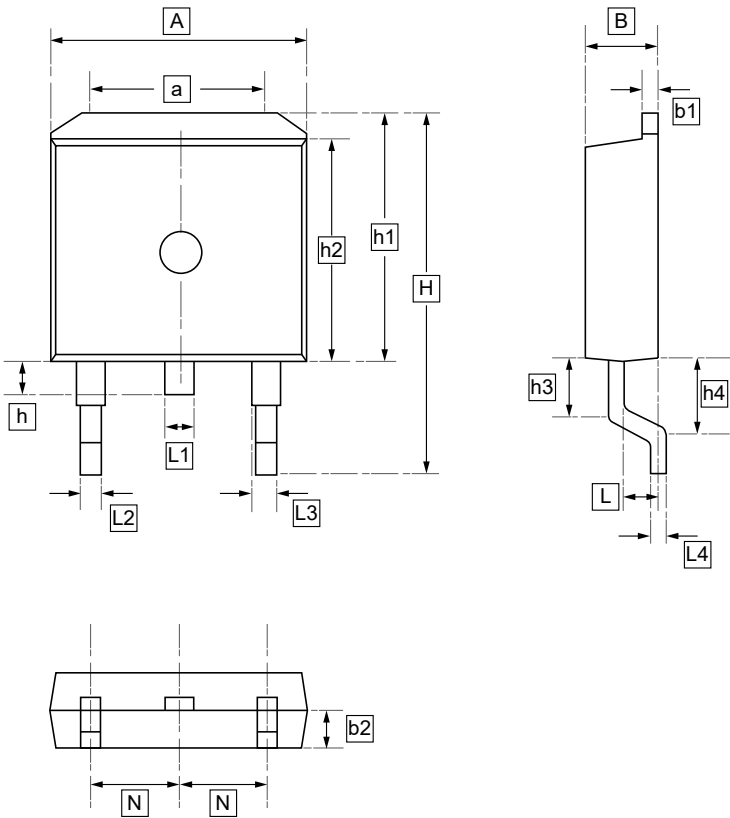


Figure 14b: Gate Charge Test Circuit



7.TO-263 Package Outline Dimensions



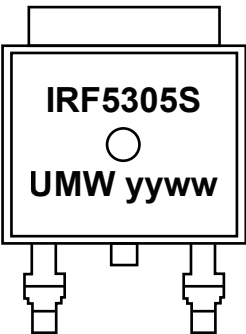
DIMENSIONS (mm are the original dimensions)

Symbol	A	a	B	b1	b2	H	h	h1	h2	h3	h4	L	L1	L2	L3
Min	9.6	7.2	4.3	1.25	2.2	15.2	1.34	10.3	9.1	1.34	2.5	2.2	1.2	0.7	1.2
Max	10.0	7.6	4.7	1.35	2.6	15.8	1.74	10.7	9.3	1.74	2.9	2.6	1.4	0.9	1.4

Symbol	L4	N
Min	0.4	2.4
Max	0.6	2.5



8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF5305STRL	TO-263	800	Tape and reel



9.Disclaimer

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