

1. Description

Fifth Generation from International Rectifier utilize advanced processing techniques to achieve the lowest possible on-resistance per silicon area.

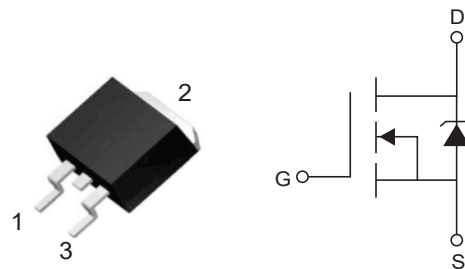
2. Features

- $V_{DS(V)}=55V$
- $I_D=47A$
- $R_{DS(ON)}<22m\Omega(V_{GS}=10V)$

3. Pinning information

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

TO-263



4. Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Continuous Drain Current, $V_{GS}=10V$ ⑤	$T_C=25^\circ C$	I_D	47	A
Continuous Drain Current, $V_{GS}=10V$ ⑤	$T_C=100^\circ C$		33	A
Pulsed Drain Current ①⑤		I_{DM}	160	A
Power Dissipation	$T_C=25^\circ C$	P_D	110	W
Linear Derating Factor			0.71	W/ $^\circ C$
Gate-to-Source Voltage		V_{GS}	± 16	V
Single Pulse Avalanche Energy ②⑤		E_{AS}	210	mJ
Avalanche Current ①		I_{AR}	25	A
Repetitive Avalanche Energy ①		E_{AR}	11	mJ
Peak Diode Recovery dv/dt ③⑤		dv/dt	5	V/ns
Storage Temperature Range		T_J, T_{STG}	-55 to 175	$^\circ C$
Soldering Temperature, for 10 seconds			300 (1.6mm from case)	$^\circ C$



5.Thermal Resistance Rating

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



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	55			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/\Delta T_J$	$I_D=1\text{mA}$, Reference to 25°C		0.07		$\text{V}/^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=25\text{A}$ ④			22	$\text{m}\Omega$
		$V_{GS}=5\text{V}$, $I_D=25\text{A}$ ④			25	$\text{m}\Omega$
		$V_{GS}=4\text{V}$, $I_D=21\text{A}$ ④			35	$\text{m}\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1		2	V
Forward Transconductance	g_{FS}	$V_{DS}=25\text{V}$, $I_D=25\text{A}$	21			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}	$V_{GS}=16\text{V}$			100	nA
Gate-to-Source Reverse Leakage		$V_{GS}=-16\text{V}$			-100	nA
Total Gate Charge	Q_g	$I_D=25\text{A}$			48	nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=44\text{V}$, $V_{GS}=5\text{V}$			8.6	nC
Gate-to-Drain ("Miller") Charge	Q_{gd}	See Fig.6 and 13 ④			25	nC
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=28\text{V}$		11		ns
Rise Time	t_r	$I_D=25\text{A}$		84		ns
Turn-Off Delay Time	$t_{D(off)}$	$R_G=3.4\Omega$, $V_{GS}=5\text{V}$		26		ns
Fall Time	t_f	$R_D=1.1\Omega$, See Fig. 10 ④		15		ns
Internal Drain Inductance	L_D	Between lead, 6mm (0.25in.)		4.5		nH
Internal source Inductance	L_S	from package and center of die contact		7.5		nH
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		1700		pF
Output Capacitance	C_{oss}	$V_{DS}=25\text{V}$		400		pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0\text{MHz}$, See Fig. 5		150		pF



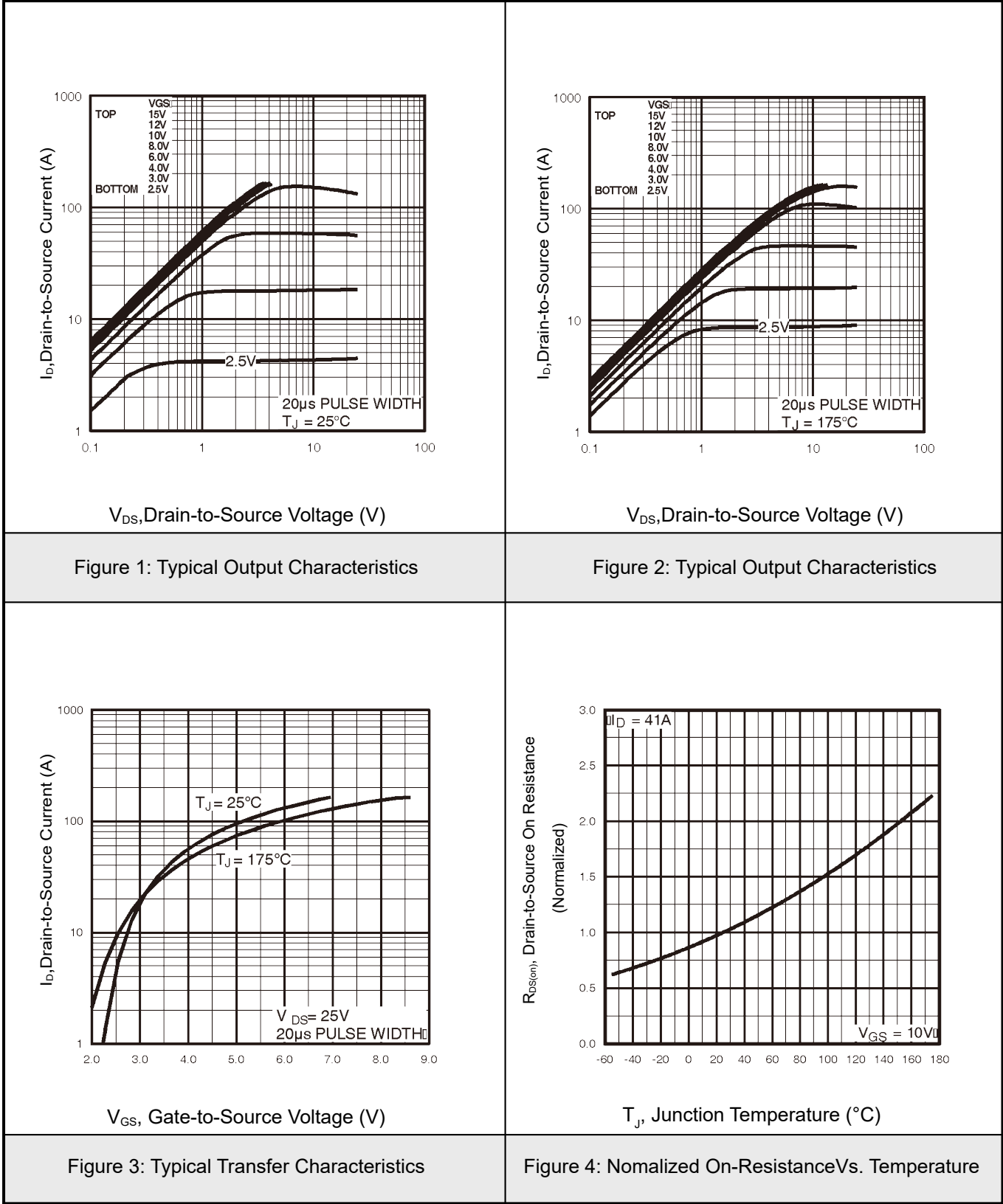
Diode Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			47	A
Pulsed Source Current (Body Diode) ①	I_{SM}				160	A
Diode Forward Voltage	V_{SD}	$T_J=25^\circ\text{C}, I_S=25\text{A}, V_{GS}=0\text{V}$ ④			1.3	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=25\text{A}$ $di/dt=100\text{A}/\mu\text{s}$ ④		80	120	ns
Reverse Recovery Charge	Q_{rr}			210	320	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 $T_J=25^\circ\text{C}$, $L=470\mu\text{H}$, $R_G=25\Omega$, $I_{AS}=25\text{A}$.(See Figure 12)
- ③ $I_{SD}\leq 25\text{A}$, $di/dt\leq 270\text{A}/\mu\text{s}$, $V_{DD}\leq V_{(BR)DSS}$, $T_J\leq 175^\circ\text{C}$
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ Uses IRLZ44N data and test conditions.

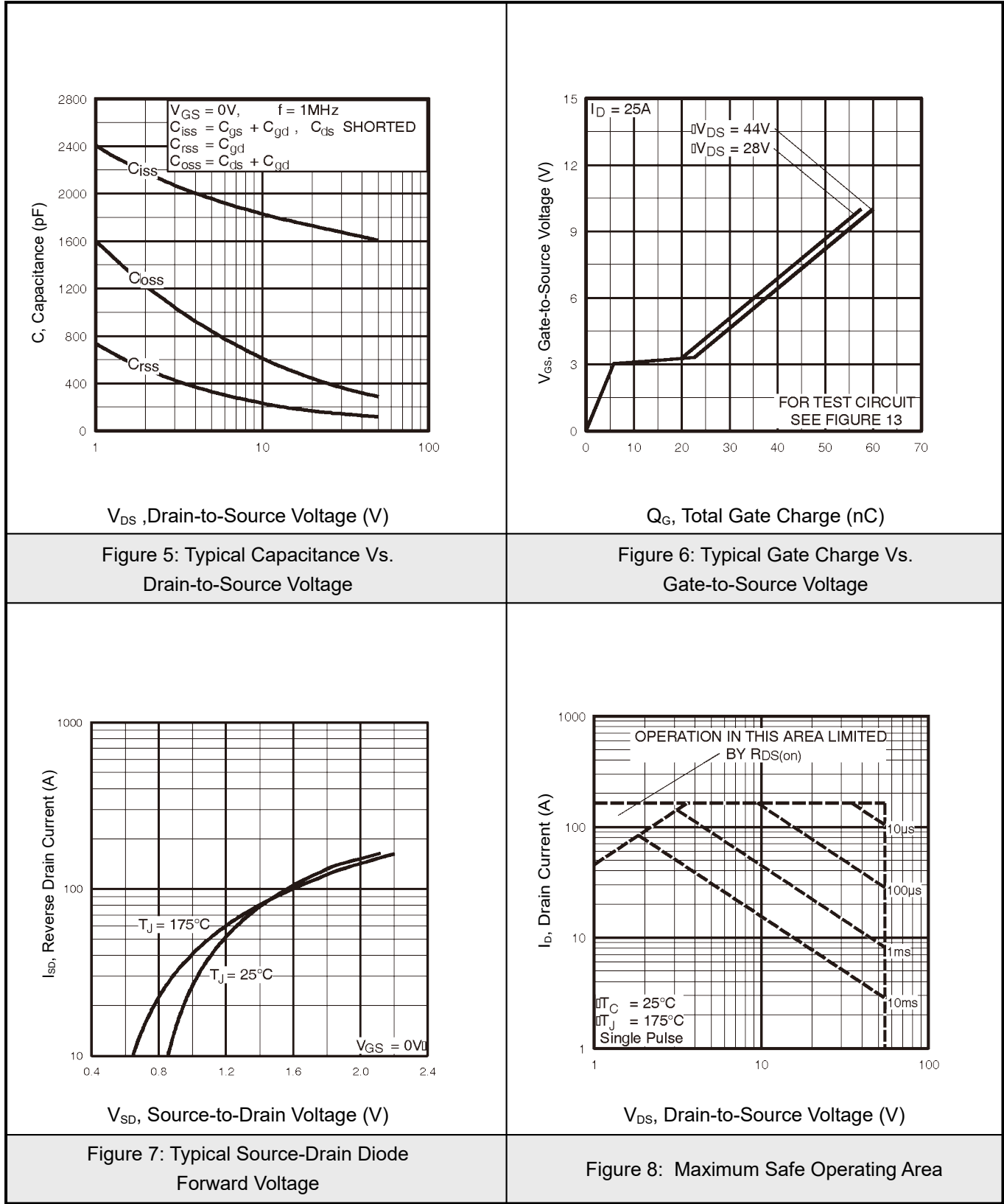


7.1 Typical Characteristics



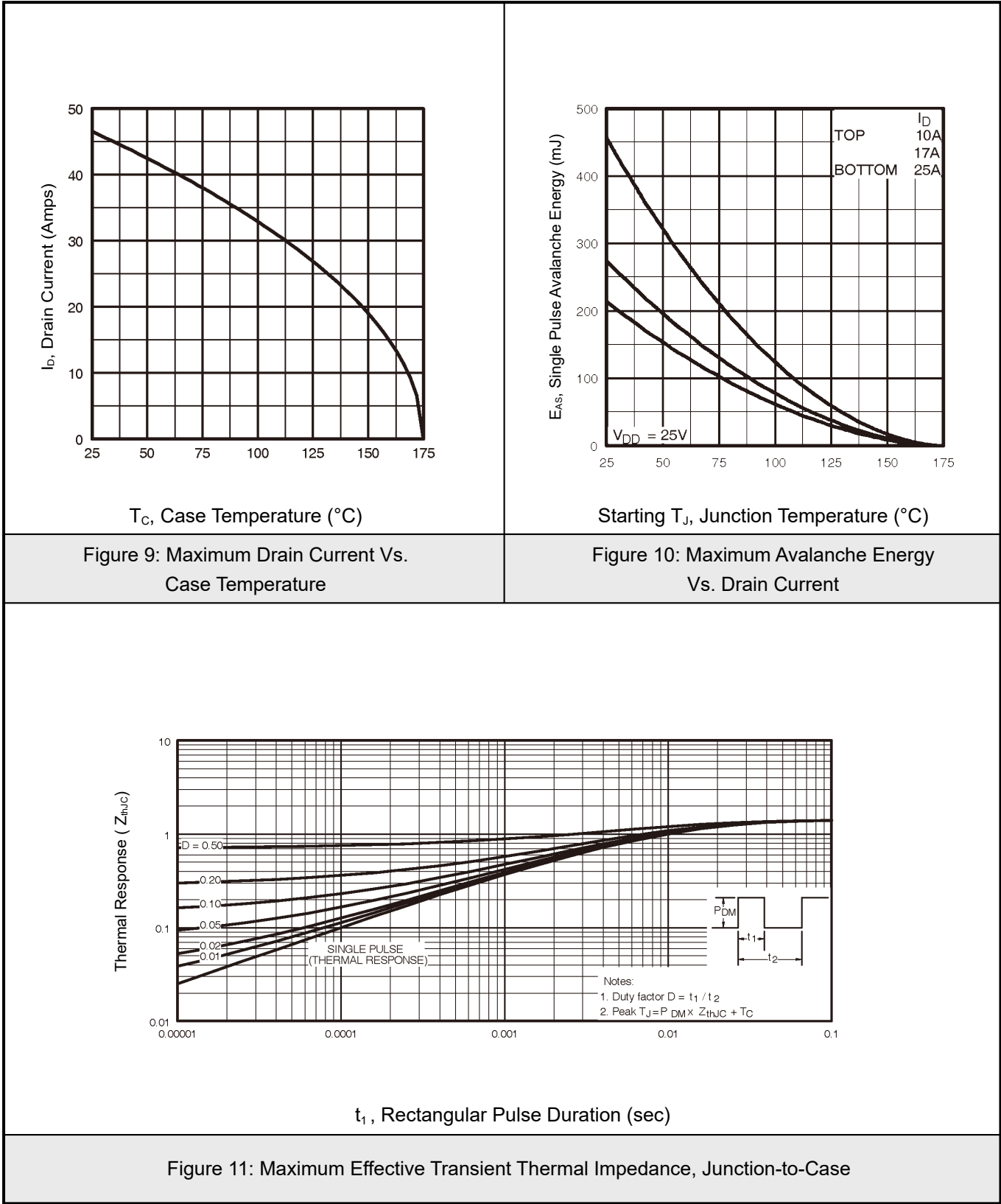


7.2Typical Characteristics





7.3Typical Characterisitics





7.4 Typical Characteristics

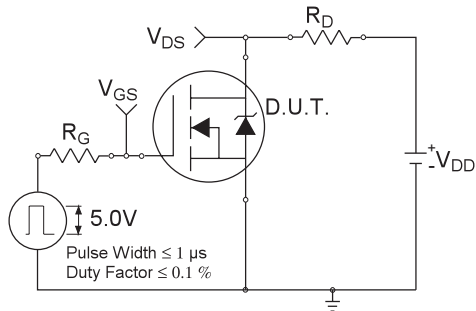


Figure 12a: Switching Time Test Circuit

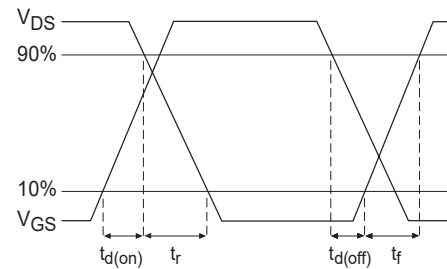


Figure 12b: Switching Time waveforms

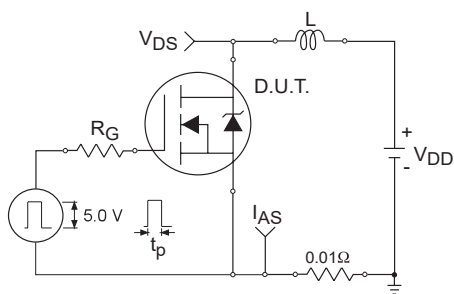


Figure 13a: Unclamped Inductive Test Circuit

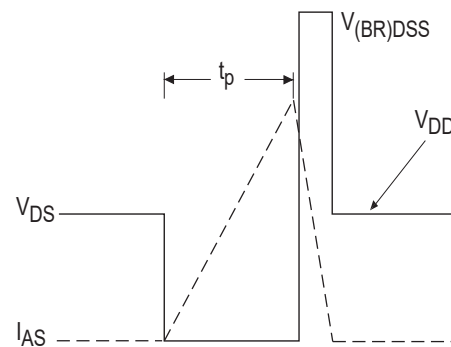


Figure 13b: Unclamped Inductive waveforms

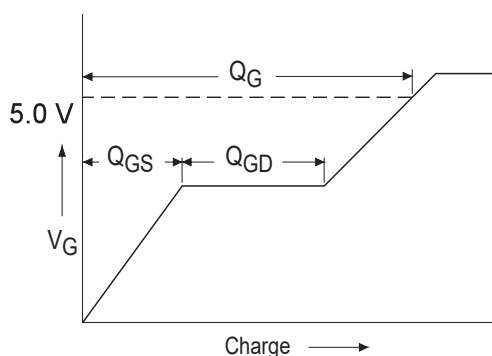


Figure 14a: Basic Gate Charge waveform

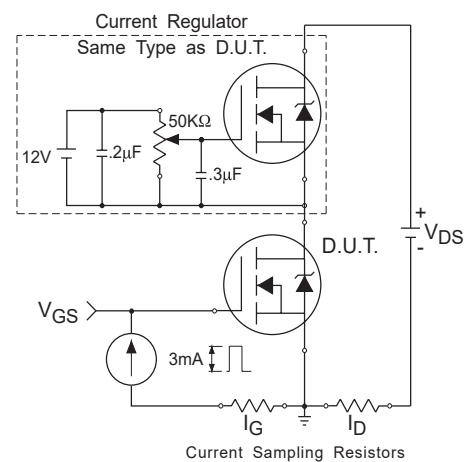
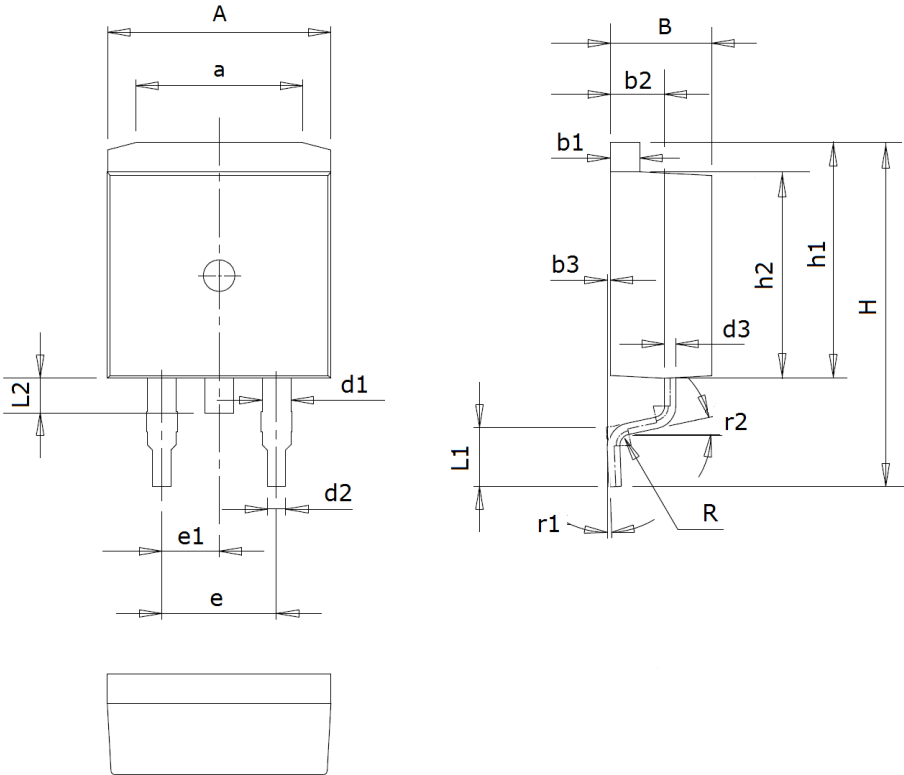


Figure 14b: Gate Charge Test Circuit



8.TO-263 Package Outline Dimensions

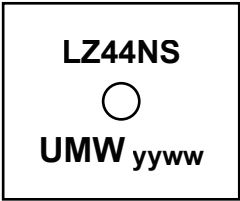


DIMENSIONS (mm are the original dimensions)

Symbol	Dimensions(mm)	Symbol	Dimensions(mm)	Symbol	Dimensions(mm)
A	9.7~10.3	d2	0.7~0.9	L1	2.4~2.9
a	7.0~7.8	d3	0.4~0.6	L2	1.3~1.8
B	4.3~4.7	e	5.08(typ)	R	0.5(typ)
b1	1.25~1.35	e1	2.54(typ)	r1	0~8°
b2	2.2~2.6	H	14.8~15.6	r2	12°(typ)
b3	0~0.2	h1	10.2~10.7		
d1	1.2~1.4	h2	8.9~9.4		



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLZ44NSTRL	TO-263	800	Tape and reel



10.Disclaimer

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