

1.Description

This benefit, combined with the fast switching speed and ruggedized device design that Power MOSFETs are well knownfor, provides the designerwith an extremely efficient device for use in a wide variety of applications.

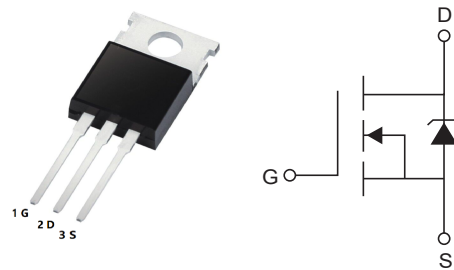
2.Features

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

2.Pinning information

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

TO-220



3.Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Continuous Drain Current, $V_{GS}=10V$	$T_C=25^{\circ}C$	I_D	47	A
Continuous Drain Current, $V_{GS}=10V$	$T_C=100^{\circ}C$		33	A
Pulsed Drain Current ①		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 Energy②		E_{AS}	210	mJ
Avalanche Current①		I_{AR}	25	A
Repetitive Avalanche Energy①		E_{AR}	11	mJ
Peak Diode Recovery dv/dt ③		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)	$^{\circ}C$
Mounting torque,6-32 or M3 Screw			10 lbf.in (1.1N.m)	



4.Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Case	$R_{\theta JC}$		1.4	°C/W
CaSe-to-Sink, Flat, Greased Surface	$R_{\theta CS}$	0.5		°C/W
Junction-to-Ambient	$R_{\theta JA}$		62	°C/W



5. 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	$\Delta V_{(BR)DSS}/T_J$	$I_D=1\text{mA}$, 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	m Ω
		$V_{GS}=5\text{V}$, $I_D=25\text{A}$ ④			25	
		$V_{GS}=4\text{V}$, $I_D=21\text{A}$ ④			35	
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	
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	
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	
Gate-to-Drain ("Miller") Charge	Q_{gd}	See Fig. 6 and 13 ④			25	
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=28\text{V}$, $I_D=25\text{A}$ $R_G=3.4\Omega$, $V_{GS}=5\text{V}$ $R_D=1.1\Omega$, See Fig. 10 ④		11		ns
Rise Time	t_r			84		ns
Turn-Off Delay Time	$t_{D(off)}$			26		ns
Fall Time	t_f			15		ns
Internal Drain inductance	L_D	Between lead, 6mm (0.25in.) from package and center of die contact		4.5		nH
Internal Source inductance	L_S			7.5		
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$ $f = 1.0\text{MHz}$, See Fig. 5		1700		pF
Output Capacitance	C_{oss}			400		pF
Reverse Transfer Capacitance	C_{rss}			150		pF



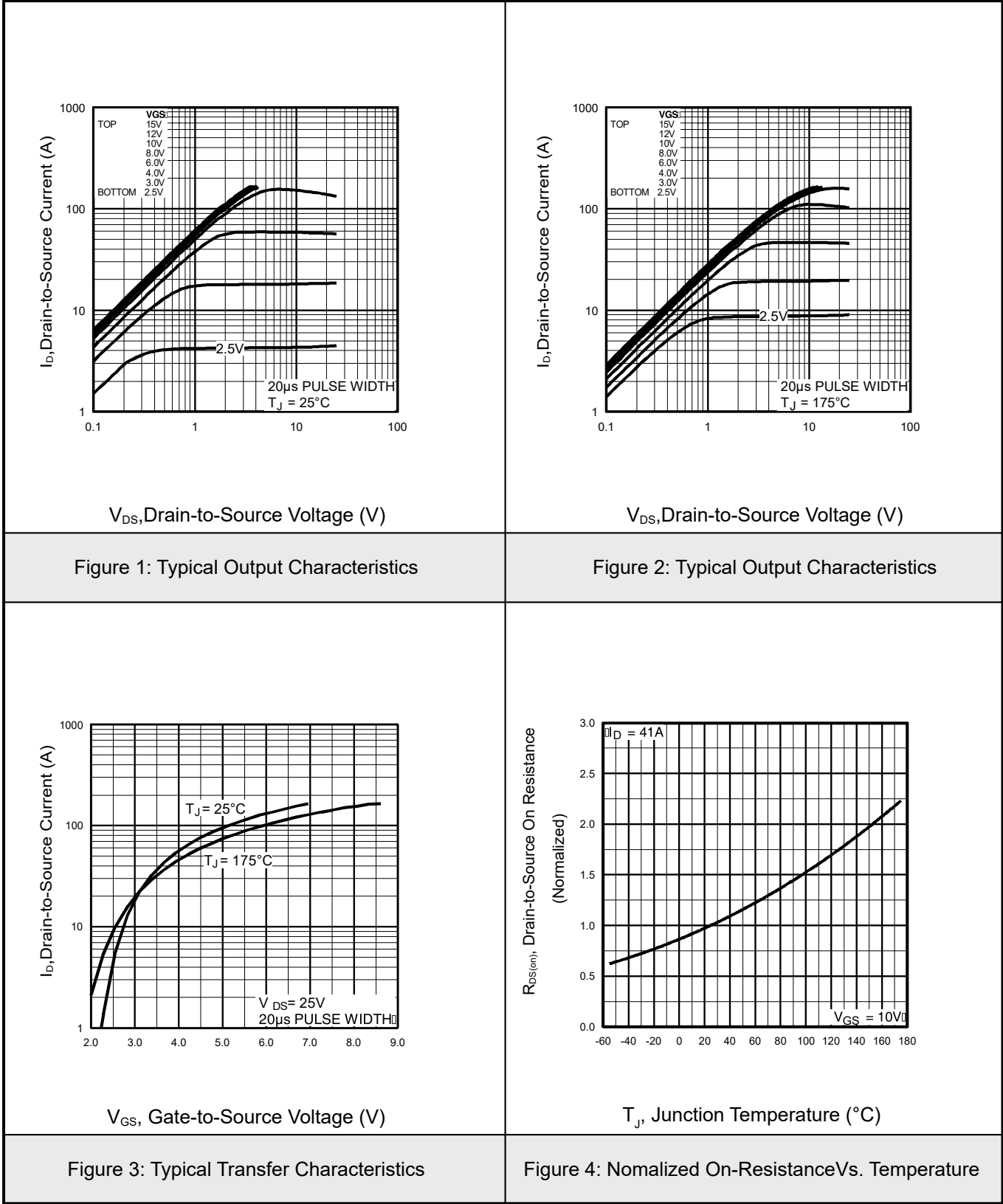
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			47	A
Pulsed Source Current (Body Diode) ①	I_{SM}				160	
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}\text{C}$, $I_S=25\text{A}$, $V_{GS}=0\text{V}$ ④			1.3	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}\text{C}$, $I_F=25\text{A}$		80	120	ns
Reverse Recovery Charge	Q_{rr}	$di/dt=100\text{A}/\mu\text{s}$ ④		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 $\leq 2\%$

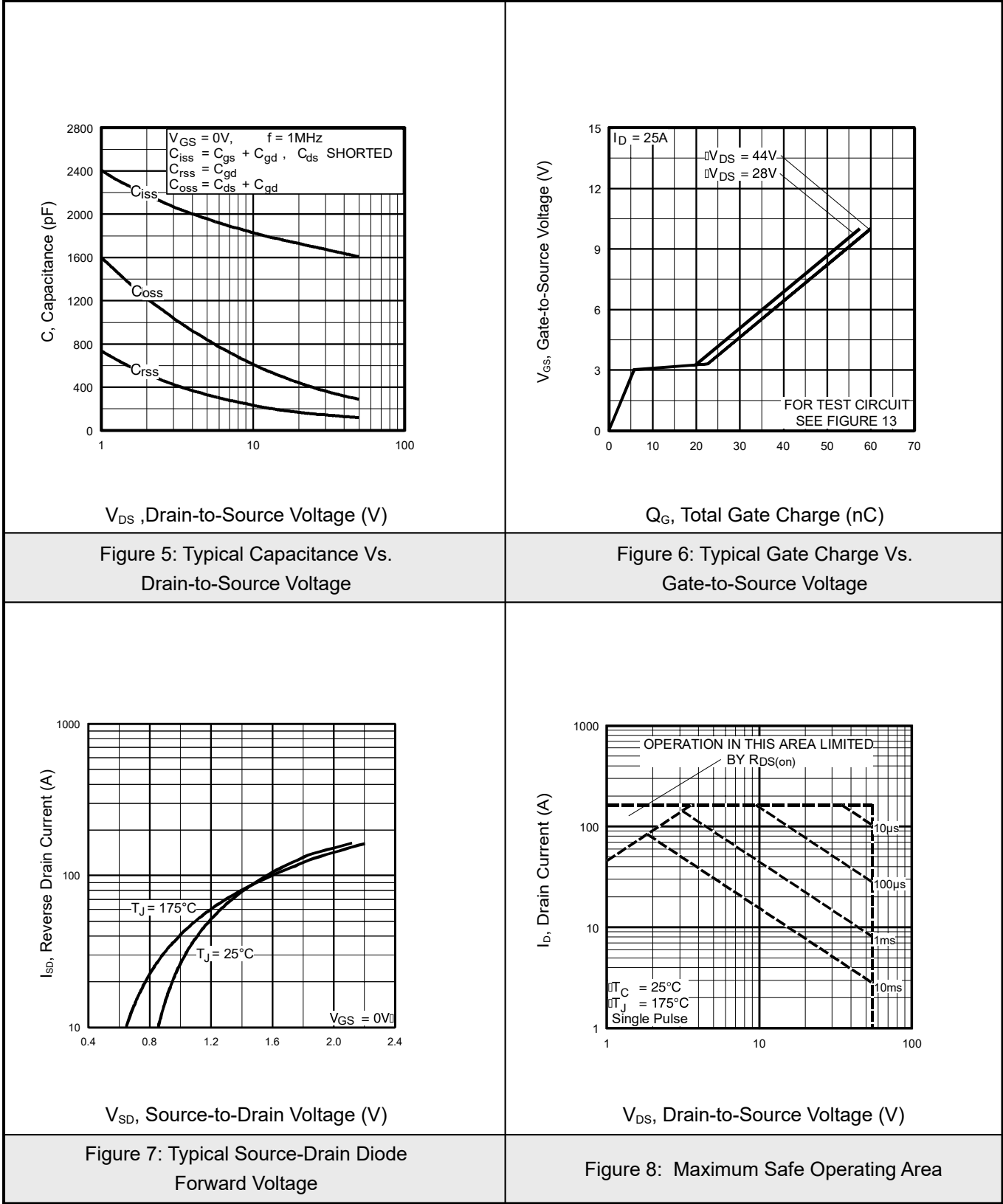


6.1 Typical Characteristics



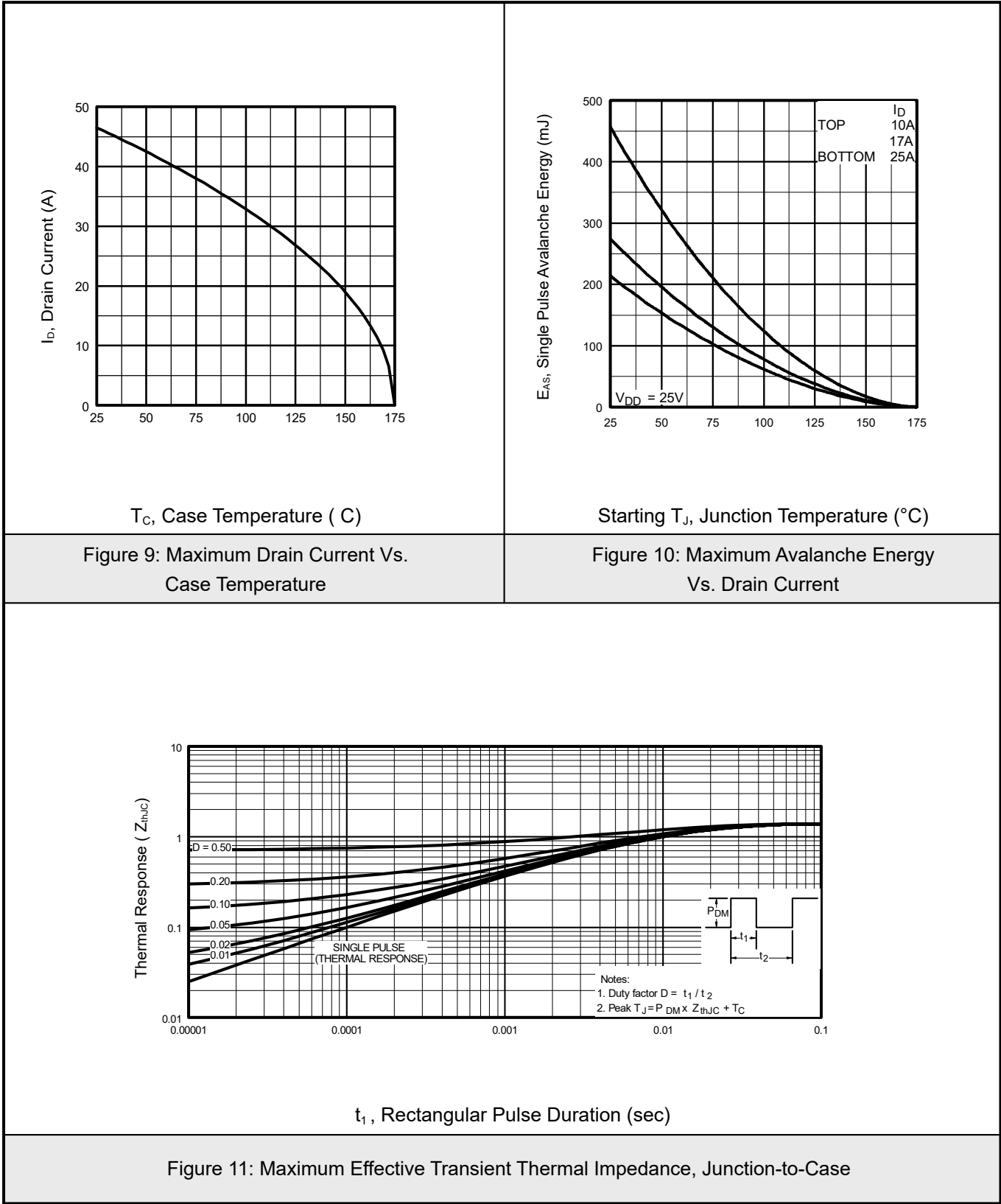


6.2Typical Characteristics





6.3Typical Characterisitics





6.4 Typical Characteristics

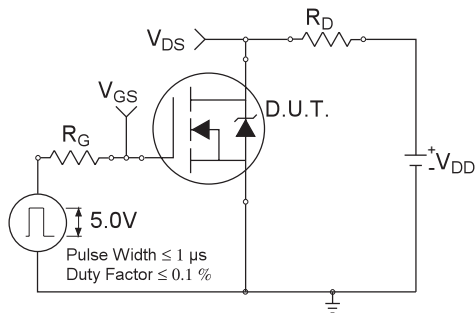


Figure 12a: Switching Time Test Circuit

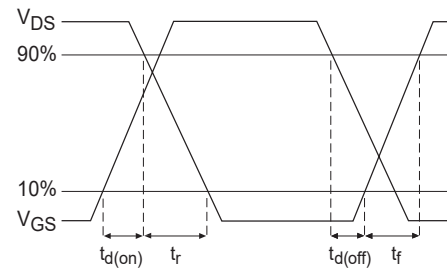


Figure 12b: Switching Time waveforms

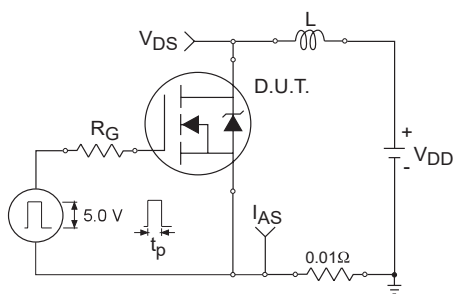


Figure 13a: Unclamped Inductive Test Circuit

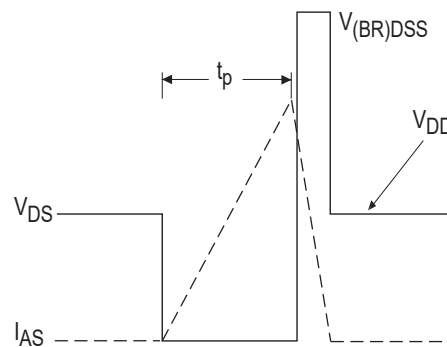


Figure 13b: Unclamped Inductive waveforms

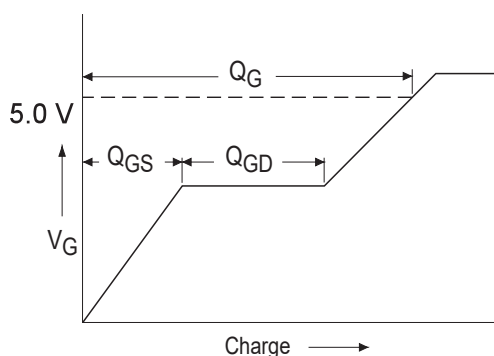


Figure 14a: Basic Gate Charge waveform

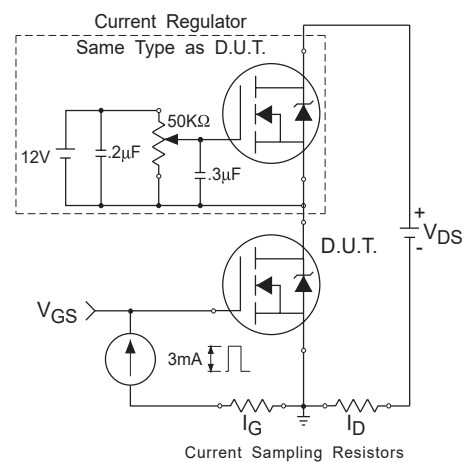
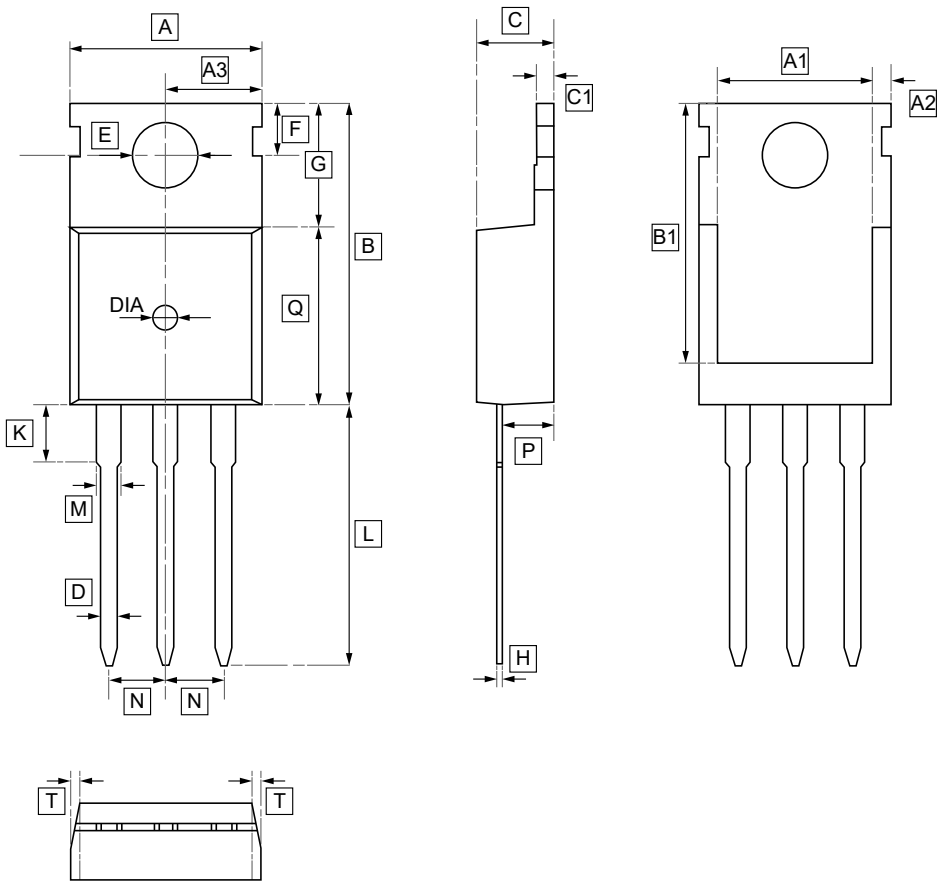


Figure 14b: Gate Charge Test Circuit



7.1 TO-220 Package Outline Dimensions



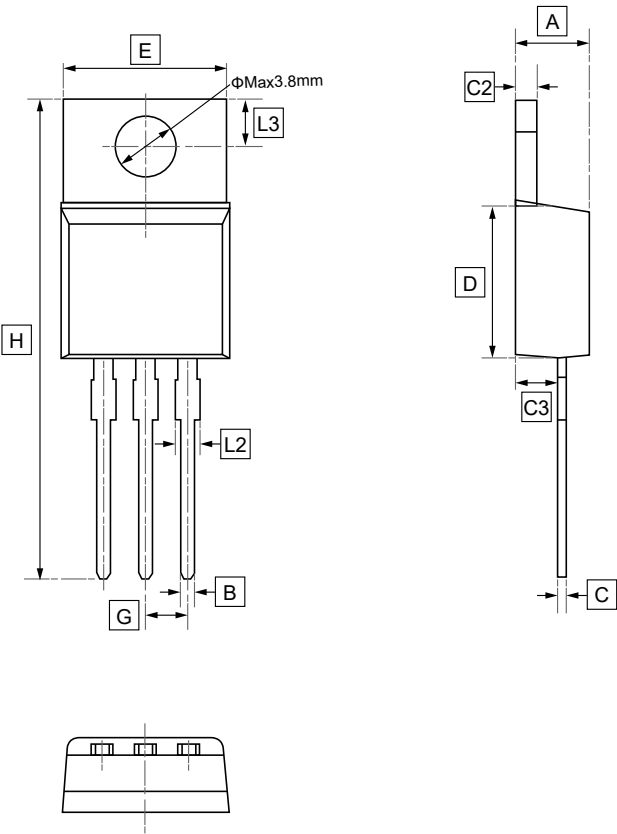
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	C	C1	D	E	F	G
Min	9.7	8.44	1.05	4.8	15.4	12.9	4.28	1.1	0.6	3.4	2.65	5.2
Max	10.3	8.84	1.25	5.2	16.2	13.5	4.68	1.5	1.0	3.8	3.25	5.8

Symbol	H	K	L	L1	M	N	P	Q	T	DIA
Min	0.4	2.9	12.8	2.7	1.15	2.49	2.1	8.7	W:0.35	⌀1.5
Max	0.6	3.3	13.6	3.3	1.35	2.59	2.7	9.3		(deep 0.2)



7.2 TO-220 Package Outline Dimensions

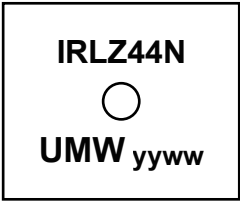


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	C2	C3	D	E	G	H	L2	L3
Min	4.30	0.60	0.28	1.17	2.30	8.80	9.80	2.44	28.55	1.10	2.59
Max	4.70	1.00	0.48	1.37	2.70	9.20	10.20	2.64	29.15	1.50	2.89



8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLZ44N	TO-220	1000	Tube and box



9.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.

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