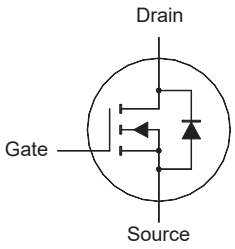
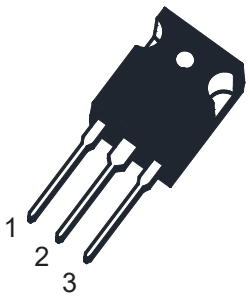
N-Channel Enhancement Mode MOSFET

Features

- Low $R_{DS(ON)}$
- Low Miller Capacitance
- Fully Characterized Capacitance and Avalanche
- Halogen and Antimony Free(HAF), RoHS compliant





TO-247 Plastic Package
1.Gate 2.Drain 3.Source

Application

- BLDC Motor drive applications
- Battery powered circuits
- Synchronous rectifier applications
- Resonant mode power supplies

Key Parameters

Parameter	Value	Unit
BV_{DSS}	100	V
$R_{DS(ON)}$ Max	4.8 @ V_{GS} = 10 V	mΩ
	6.3 @ V_{GS} = 4.5 V	
$V_{GS(th)}$ typ	1.9	V
Q_g typ	78 @ V_{GS} = 10 V	nC

Absolute Maximum Ratings (at T_a = 25℃ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	T_c = 25℃ T_c = 100℃	I_D	108 68	A
Peak Drain Current, Pulsed [1]		I_{DM}	480	A
Avalanche Current		I_{AS}	30	A
Single Pulse Avalanche Energy [2]		E_{AS}	226.5	mJ
Power Dissipation	T_c = 25℃	P_D	104.1	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to + 150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.2	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	40	℃/W

[1] Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%,Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

[2] Limited by $T_{J(MAX)}$, starting T_J = 25 °C, L = 0.5 mH, R_g = 25 Ω, I_{AS} = 30 A, V_{GS} = 10 V.

Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607

Characteristics at T_a = 25℃ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I_D = 1 mA	BV_{DSS}	100	-	-	V
Drain-Source Leakage Current at V_{DS} = 100 V	I_{DSS}	-	-	1	μA
Gate Leakage Current at V_{GS} = ± 20 V	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_D = 250 μA	$V_{GS(th)}$	1.2	-	2.4	V
Drain-Source On-State Resistance at V_{GS} = 10 V, I_D = 50 A at V_{GS} = 4.5 V, I_D = 20 A	$R_{DS(on)}$	- -	4.2 -	4.8 6.3	mΩ
DYNAMIC PARAMETERS					
Forward Transconductance at V_{DS} = 5 V, I_D = 30 A	g_{fs}	-	66.8	-	S
Gate Resistance at V_{GS} = 0 V, V_{DS} = 0 V, f = 1 MHz	R_g	-	1.1	-	Ω
Input Capacitance at V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz	C_{iss}	-	3796	-	pF
Output Capacitance at V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz	C_{oss}	-	683	-	pF
Reverse Transfer Capacitance at V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz	C_{rss}	-	34	-	pF
Gate charge total at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 4.5 V	Q_g	- -	78 42	- -	nC
Gate to Source Charge at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V	Q_{gs}	-	14	-	nC
Gate to Drain Charge at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V	Q_{gd}	-	24	-	nC
Turn-On Delay Time at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V, R_g = 3.3 Ω	$t_{d(on)}$	-	27	-	ns
Turn-On Rise Time at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V, R_g = 3.3 Ω	t_r	-	42	-	ns
Turn-Off Delay Time at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V, R_g = 3.3 Ω	$t_{d(off)}$	-	26	-	ns
Turn-Off Fall Time at V_{DS} = 50 V, I_D = 50 A, V_{GS} = 10 V, R_g = 3.3 Ω	t_f	-	6	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I_S = 1 A, V_{GS} = 0 V	V_{SD}	-	-	1.3	V
Body-Diode Continuous Current	I_S	-	-	108	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	480	A
Body Diode Reverse Recovery Time at I_S = 50 A, V_{DD} = 50 V, di/dt = 200 A / μs	t_{rr}	-	49	-	ns
Body Diode Reverse Recovery Charge at I_S = 50 A, V_{DD} = 50 V, di/dt = 200 A / μs	Q_{rr}	-	131	-	nC

Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

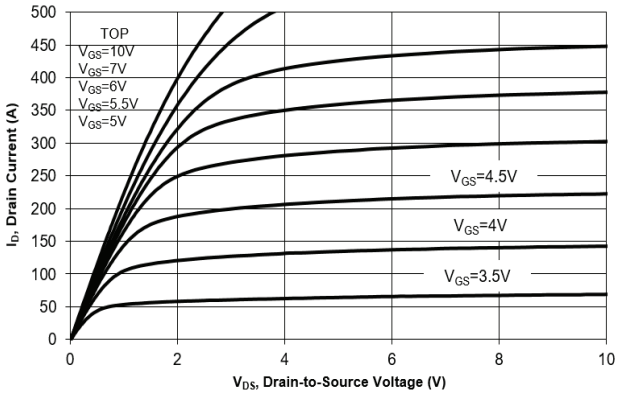


Fig. 2 Typical Transfer Characteristics

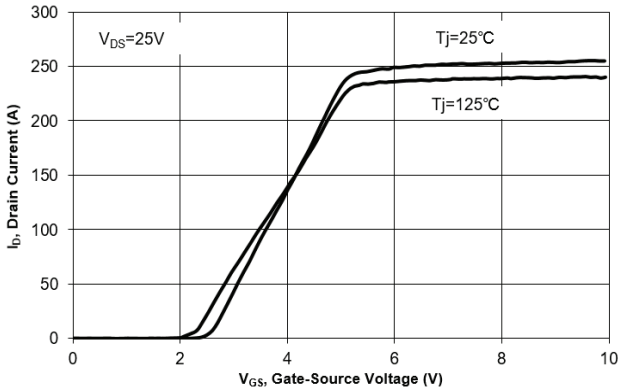


Fig. 3 On-Resistance vs. Drain Current

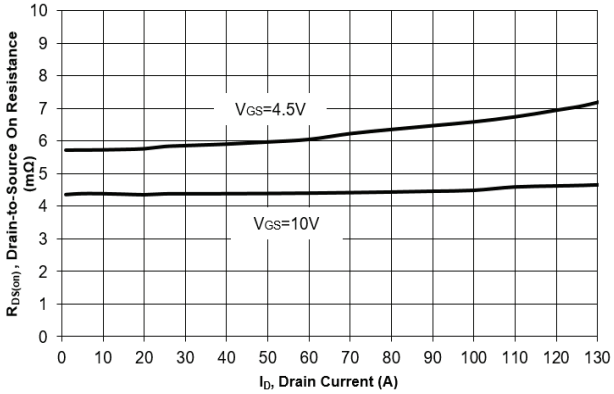


Fig. 4 On-Resistance vs. Gate to Source Voltage

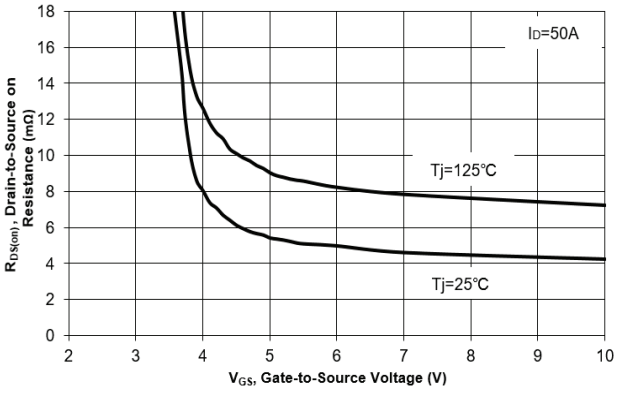


Fig. 5 On-Resistance vs.T_j

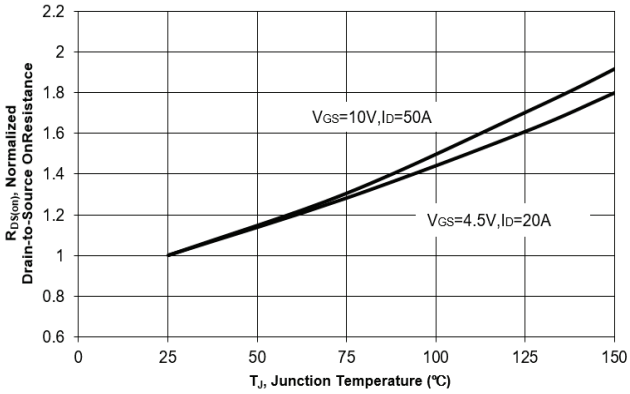
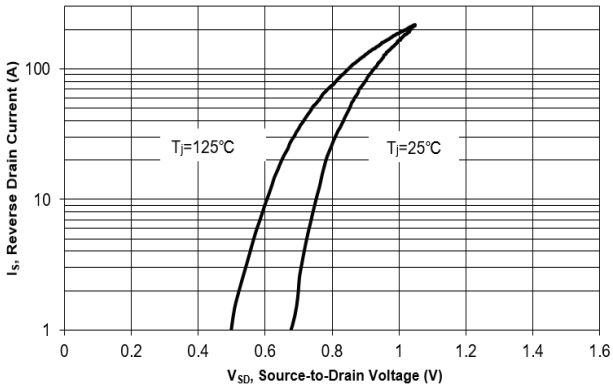


Fig. 6 Typical Body-Diode Forward Characteristics



Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607

Electrical Characteristics Curves

Fig. 13 Normalized Maximum Transient Thermal Impedance($z_{\Theta JC}$)

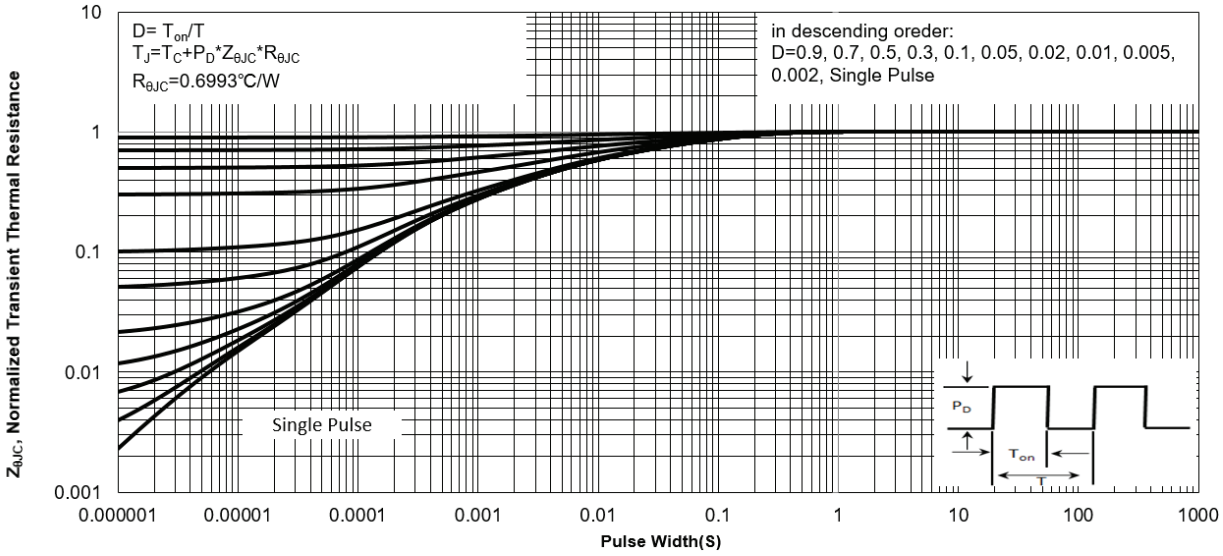
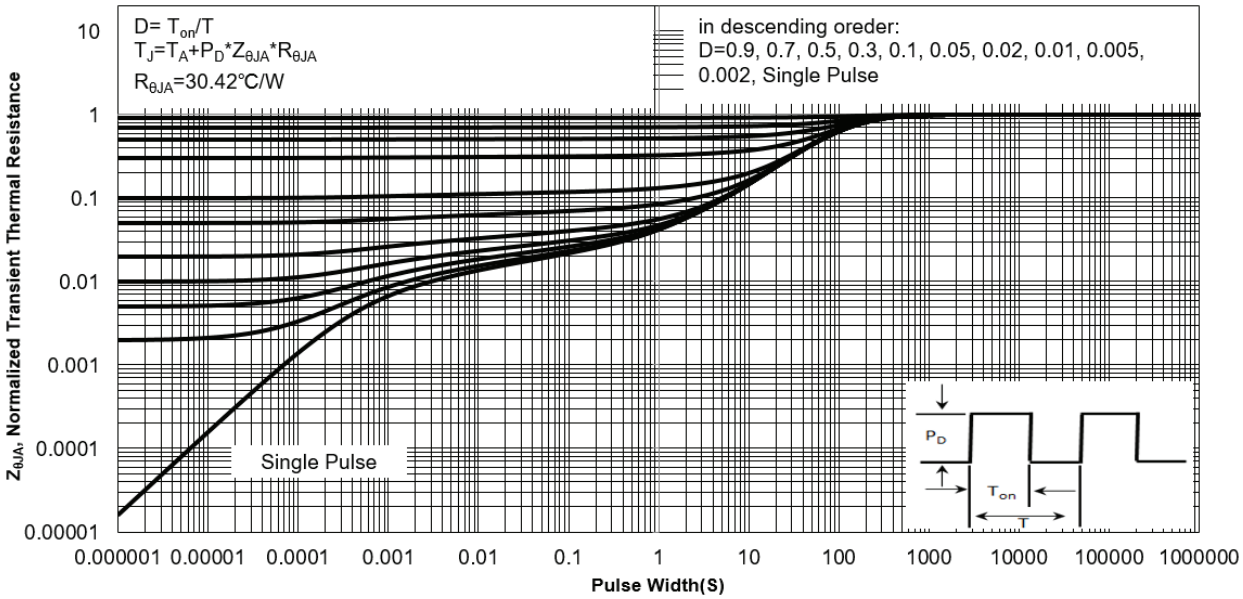


Fig. 14 Normalized Maximum Transient Thermal Impedance($z_{\Theta JA}$)



Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607

Fig. 7 Typical Junction Capacitance

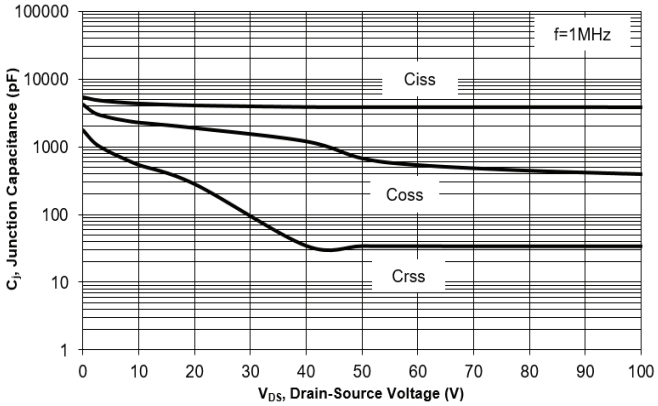


Fig. 8 Drain-Source Leakage Current vs. T_j

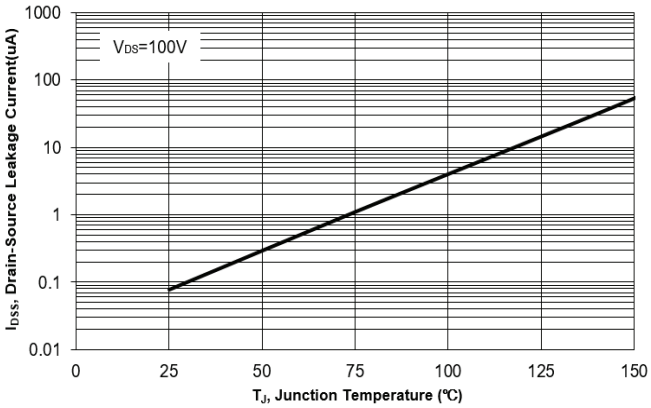


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

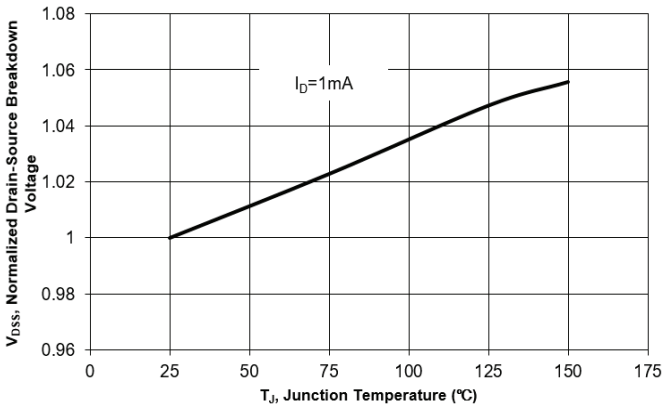


Fig. 10 Gate Threshold Variation vs. T_j

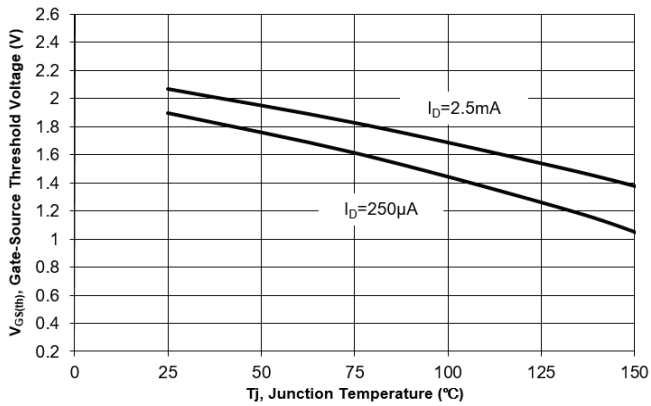


Fig. 11 Gate Charge

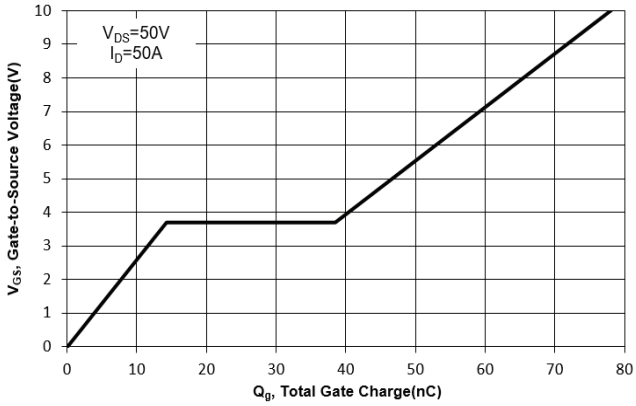
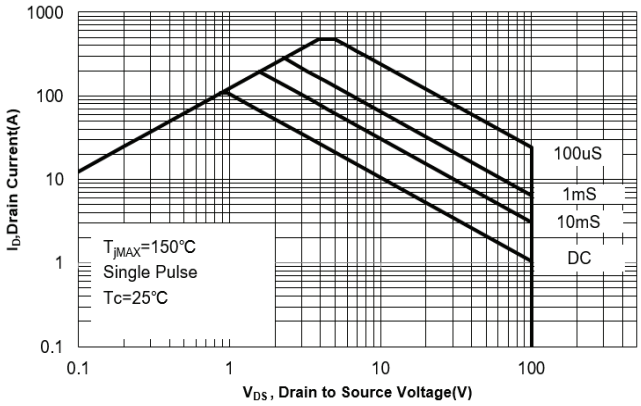


Fig. 12 Safe Operation Area



Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607

Test Circuits

Fig.1-1 Switching times test circuit

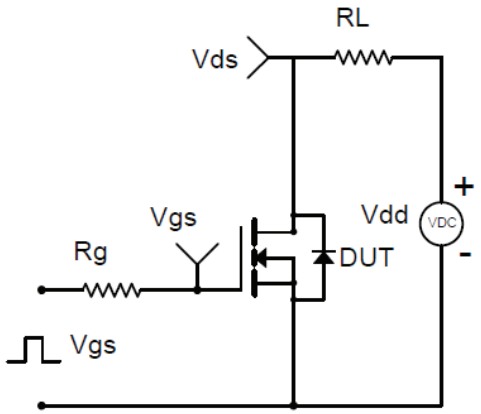


Fig.1-2 Switching Waveform

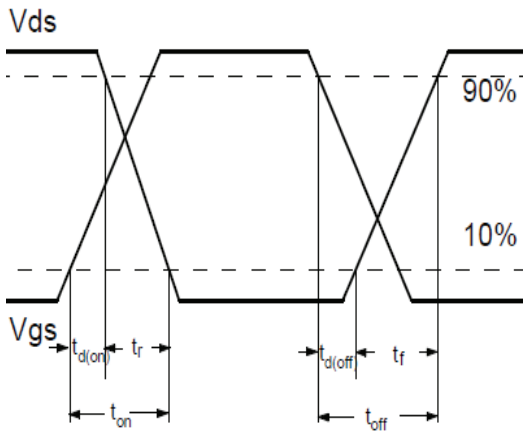


Fig.2-1 Gate charge test circuit

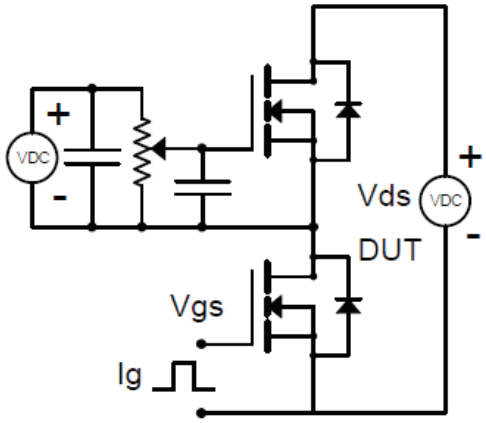


Fig.2-2 Gate charge waveform

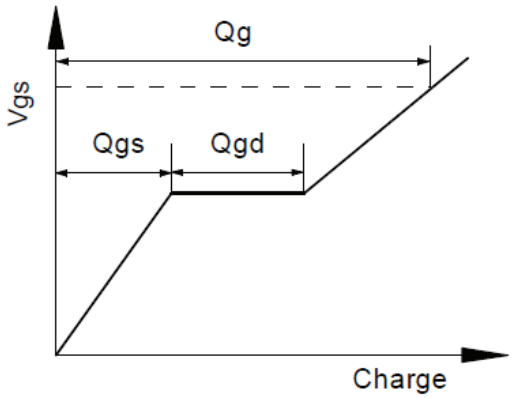


Fig.3-1 Avalanche test circuit

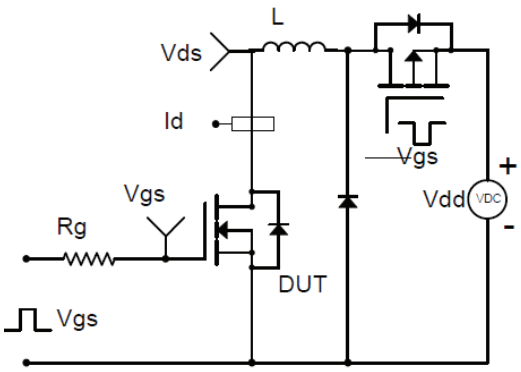
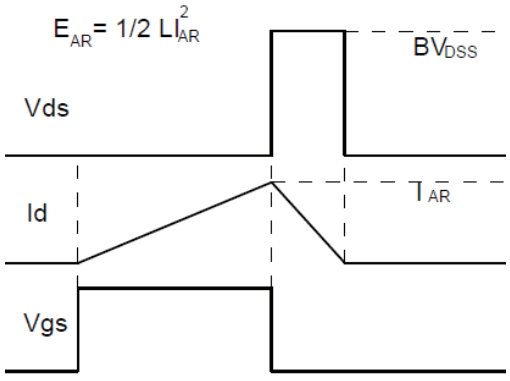


Fig.3-2 Avalanche waveform



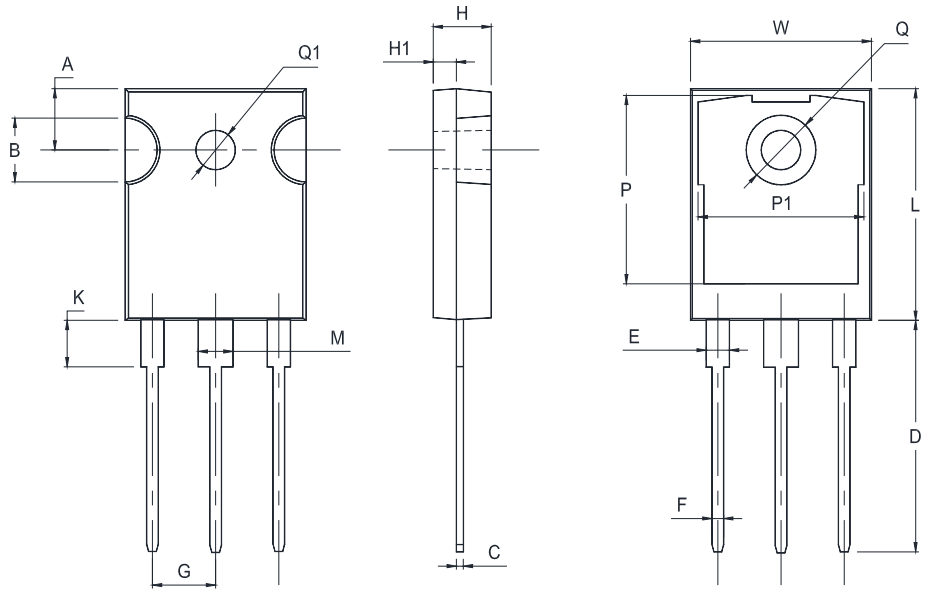
Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607

Package Outline Dimensions (Units: mm)

TO-247



UNIT	A	B	C	D	E	F	G	W	H	H1	K	L	M	P
mm	6.5	5.2	0.7	20.3	2.2	1.3	5.7	16.2	5.3	2.4	4.45	21.3	3.2	16.6
	5.9	4.6	0.5	19.7	1.8	1.1	5.1	15.8	4.7	1.8	4.05	20.7	2.8	16.2

UNIT	P1	Q	Q1
mm	14.2	7.35	4.2
	13.8	7.05	3.6

Packing information

Package	Carton Quantity	Box Quantity	Base Quantity	Delivery Mode
TO-247	2.88 K / Carton	720 pcs / Box	30 pcs / Tube	Tube

Marking information

" DPT10N042LS " = Part No
" ****** " = Date Code Marking
Font type: Arial

Surge Components Inc. (USA)
sales@surgecomponents.com
+1 (631) 595-1818

Surge Components EMEA (Europe)
roger@surgecomponents.com
+44-203-983-9133

Surge Components.Ltd. (Asia)
surgehk@surgecomponents.com.hk
+852-2172-7607