Features
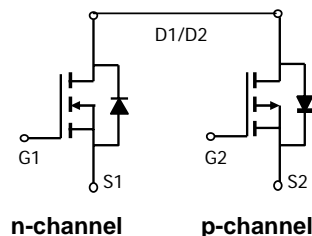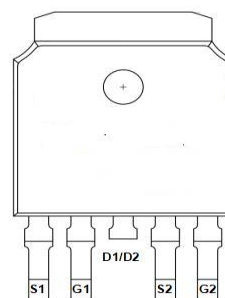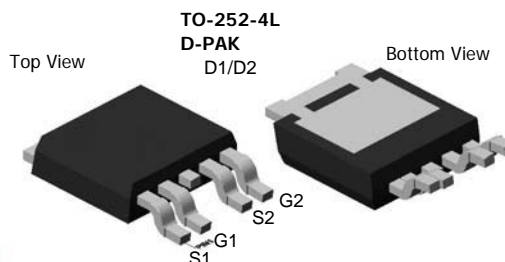
- 20V, 65A

  $R_{DS(ON)}$ Typ = 5.0mΩ @ V_{GS} = 4.5V

  $R_{DS(ON)}$ Typ = 7.0mΩ @ V_{GS} = 2.5V

- -20V, -65A

  $R_{DS(ON)}$ Typ = 5.0mΩ @ V_{GS} = -4.5V

  $R_{DS(ON)}$ Typ = 7.0mΩ @ V_{GS} = -2.5V

- Advanced Trench Technology

- Excellent $R_{DS(ON)}$ and Low Gate Charge

Application

- Load Switch

- PWM Application

- Power Management

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		N-Channel Value	P-Channel Value	Units
V_{DS}	Drain-to-Source Voltage		20	-20	V
V_{GS}	Gate-to-Source Voltage		±12	±12	V
I_D	Continuous Drain Current	T_C = 25°C	65	-65	A
		T_C = 100°C	38	-38	
I_{DM}	Pulsed Drain Current [1]		120	-120	A
E_{AS}	Single Pulsed Avalanche Energy [2]		25	25	mJ
P_D	Power Dissipation	T_C = 25°C	22.3	22.3	W
$R_{θJC}$	Thermal Resistance, Junction to Ambient		5.6	5.6	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150		°C

N-Channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250µA, V_{GS} = 0V	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	-	-	1.0	µA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250µA	0.5	0.9	1.1	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance[3]	V_{GS} = 4.5V, I_D = 25A	-	5.0	6.5	mΩ
		V_{GS} = 2.5V, I_D = 15A	-	7.0	10	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	1935	-	pF
C_{oss}	Output Capacitance		-	287	-	pF
C_{rss}	Reverse Transfer Capacitance		-	265	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V V_{DS} = 10V, I_D = 20A	-	23	-	nC
Q_{gs}	Gate Source Charge		-	4.6	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	6.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 4.5V, V_{DD} = 10V I_D= 20A, R_{GEN} = 3Ω	-	12	-	ns
t_r	Turn-On Rise Time		-	33	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	48	-	ns
t_f	Turn-Off Fall Time		-	95	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	65	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 10A, di/dt = 100A/us	-	11	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	3	-	nC

P-Channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250µA, V_{GS} = 0V	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -20V, V_{GS} = 0V	-	-	-1.0	µA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250µA	-0.3	-0.8	-1.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance[3]	V_{GS} = -4.5V, I_D = -15A	-	5.0	7.0	mΩ
		V_{GS} = -2.5V, I_D = -12A	-	7.0	10	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz	-	3947	-	pF
C_{oss}	Output Capacitance		-	499	-	pF
C_{rss}	Reverse Transfer Capacitance		-	451	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -4.5V V_{DS} = -10V, I_D = -15A	-	46	-	nC
Q_{gs}	Gate Source Charge		-	7.3	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	9.9	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -10V, V_{DD} = -10V I_D= -14A, R_{GEN} = 2.7Ω	-	10	-	ns
t_r	Turn-On Rise Time		-	59	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	111	-	ns
t_f	Turn-Off Fall Time		-	43	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-65	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-120	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -20A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -10A, di/dt = 100A/us	-	18	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	10	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=10V, V_G=4.5V, R_G=25ohm, L=0.5mH, I_{AS}=10A

   E_{AS} condition: Starting T_J=25C, V_{DD}=-10V, V_G=-4.5V, R_G=25ohm, L=0.5mH, I_{AS}=-10A

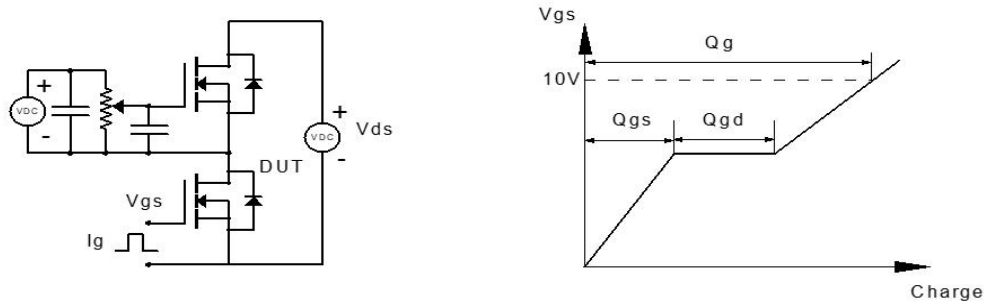3. Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%.

Test Circuit

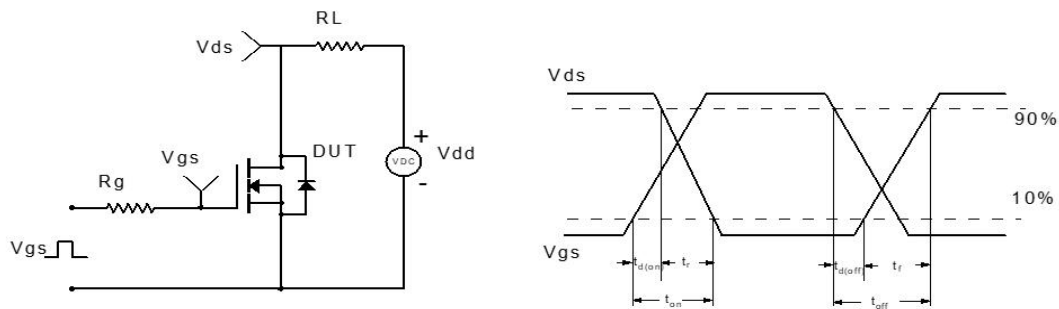**Figure 1: Gate Charge Test Circuit & Waveform**
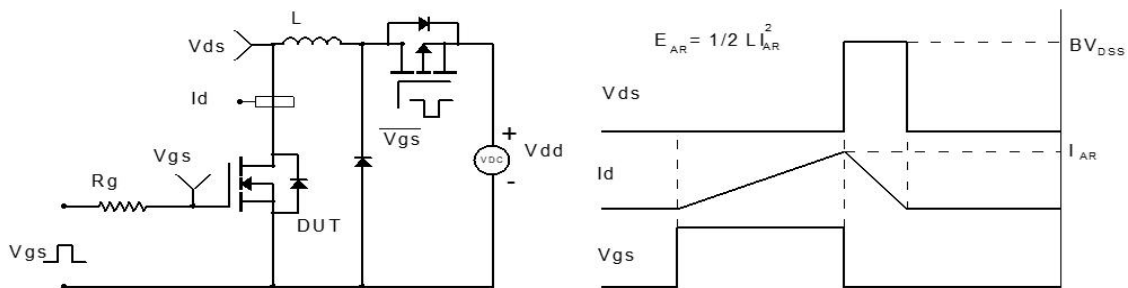

Figure 2: Resistive Switching Test Circuit & Waveform

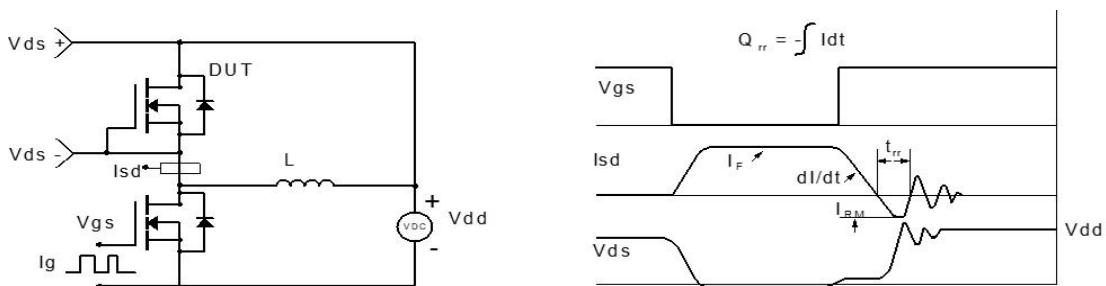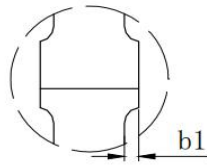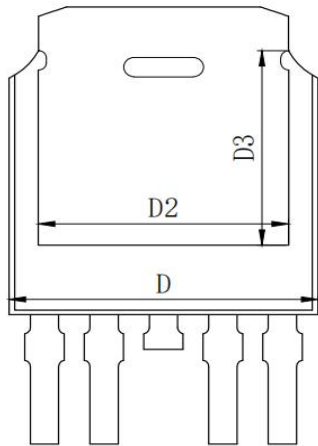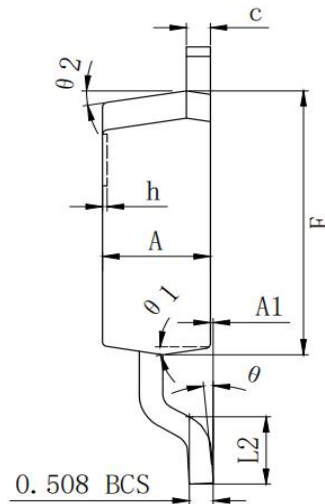**Figure 3: Unclamped Inductive Switching Test Circuit& Waveform**

Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-252-4L)

SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.550	0.600	0.650
b1	0.000		0.120
c(电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1		5.334 REF	
D2		5.346 REF	
D3		4.490 REF	
E	6.000	6.100	6.200
e		1.270 TYP	
e1		2.540 TYP	
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1		2.988 REF	
L2	1.400	1.550	1.700
L3		1.600 REF	
L4	0.700	0.800	0.900
Φ	1.100	1.200	1.300
θ	0°		8°
θ1		9° TYP	
θ2		9° TYP	