

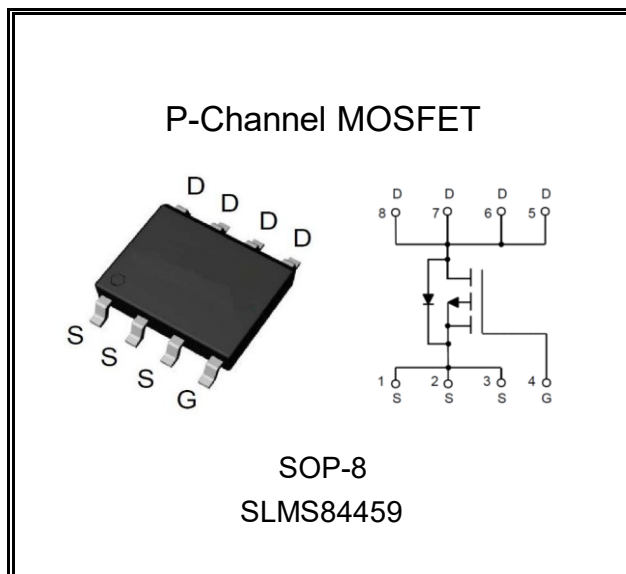
-30V/-5A P-Channel Power MOSFET

Features

- $V_{DS} = -30V$, $I_D = -5 A$
- Low $R_{DS(ON)}$
 $R_{DS(ON)} = 47m\Omega$ (max) @ $V_{GS} = -10V$
- Advanced Trench Technology
- Fast switching and fully avalanche rated
- Exceptional dv/dt capacity
- Lead free and Green Device Available

Applications

- PWM Application
- Power Management
- Load switch



Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D @ $T_C = 25^\circ C$	Continuous Drain Current, V_{GS} @ 10V	-5	A
I_D @ $T_C = 100^\circ C$	Continuous Drain Current, V_{GS} @ 10V	-3	
I_{DM}	Pulsed Drain Current ①	-20	
P_D @ $T_C = 25^\circ C$	Power Dissipation	2	W
P_D @ $T_C = 100^\circ C$	Power Dissipation	1	W
E_{AS}	Single Pulse Avalanche Energy ②	18	mJ
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Maximum Junction-to-Case	53	$^\circ C/W$
$R_{\theta JA}$	Maximum Junction-to-Ambient	62.5	$^\circ C/W$

Ordering Information

Part Number	Package Tupe	Standard Park		Reel Size
		Form	Quantity	
SLMS84459	SOP-8	Tape and Reel	4000	13 inch

Electrical Characteristics @ TJ = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{DSS}	Drain-to-Source Breakdown Voltage	-30	—	—	V	V _{GS} = 0V, I _D = -250 µA
R _{DS(ON)}	Static Drain-to-Source On-Resistance ^③	—	39	47	mΩ	V _{GS} = -10V, I _D = -4 A
		—	63	75	mΩ	V _{GS} = -4.5V, I _D = -2 A
V _{GS(th)}	Gate Threshold Voltage	-1.0	-1.5	-2.5	V	V _{DS} = V _{GS} , I _D = -250 µA
I _{DSS}	Drain-to-Source Leakage Current	—	—	-1	µA	V _{DS} = -30 V, V _{GS} = 0V T _J = 85°C
		—	—	-30		
I _{GSS}	Gate-to-Source Forward Leakage	—	—	±100	nA	V _{GS} = ±20 V, V _{DS} = 0 V

Dynamic Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
Q _g	Total Gate Charge	—	10	—	nC	I _D = -2 A, V _{DS} = -15 V, V _{GS} = -10V
Q _{gs}	Gate-to-Source Charge	—	2.1	—		
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	2	—		
t _{d(on)}	Turn-On Delay Time	—	3.1	—	ns	V _{DS} = -15 V, I _D = -10 A, R _G = 3Ω, V _{GS} = -10 V
t _r	Rise Time	—	25	—		
t _{d(off)}	Turn-Off Delay Time	—	2.2	—		
t _f	Fall Time	—	16	—		
C _{iss}	Input Capacitance	—	412	—	pF	V _{GS} = 0 V, V _{DS} = -15 V, f = 1.0 MHz
C _{oss}	Output Capacitance	—	70	—		
C _{rss}	Reverse Transfer Capacitance	—	63	—		

Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode) ^③	—	—	-5	A	
V _{SD}	Diode Forward Voltage	—	-0.8	-1.2	V	I _{SD} = -5 A, V _{GS} = 0 V

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting T_J = 25°C, V_{DD} = -20V, V_G = -10V, L = 0.5mH, I_{AS} = -8.5A.
- ③ Pulse width ≤ 300µs; duty cycles ≤ 2%.

Typical Operating Characteristics

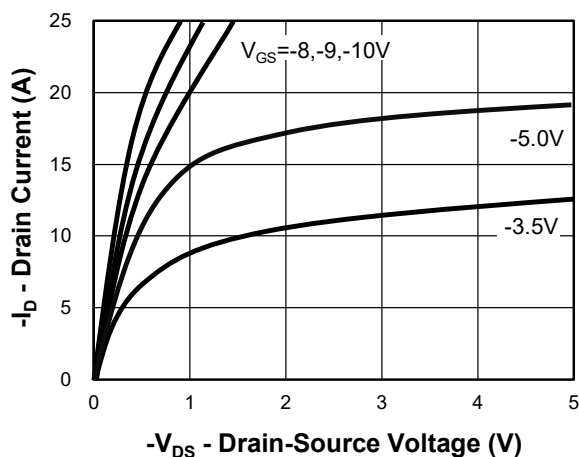


Fig 1. Output Characteristics

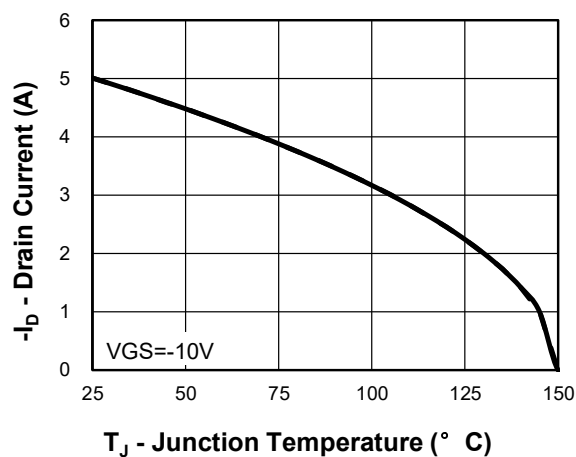


Fig 2. Drain Current

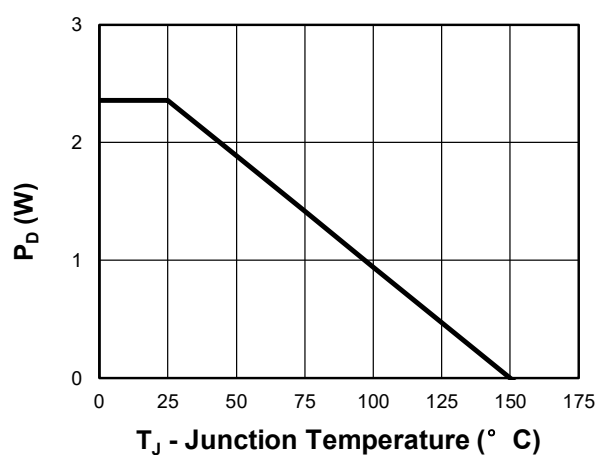


Fig 3. Power Dissipation

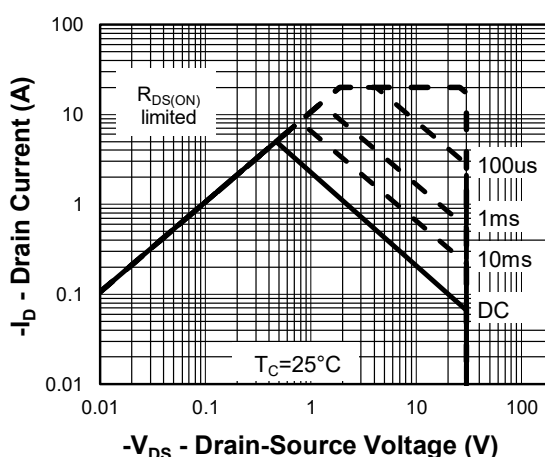


Fig 4. Safe Operation Area(SOA)

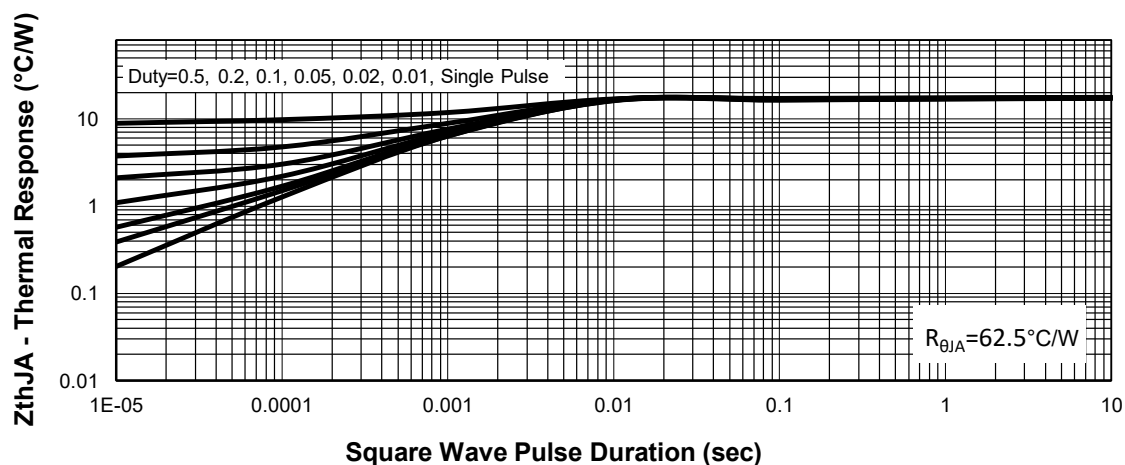


Fig 5. Thermal Transient Impedance

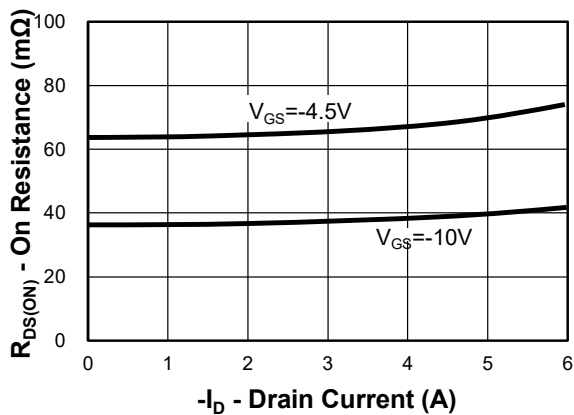


Fig 6. Rdson vs. Drain Current Characteristics

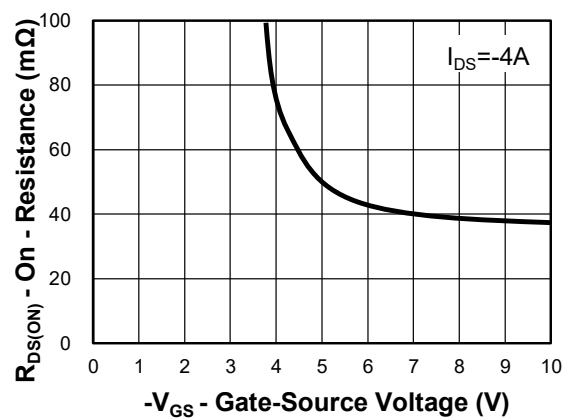


Fig 7. Gate-Source on Resistance

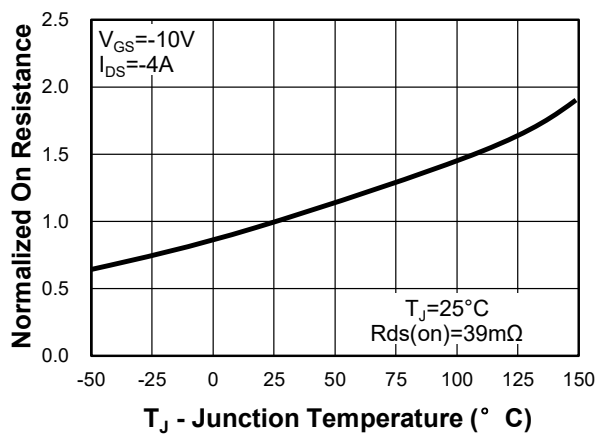


Fig 8. Rdson vs. Junction Tem Characteristics

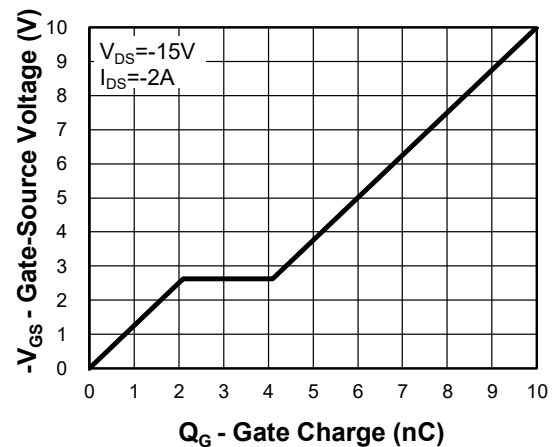


Fig 9. Gate Charge Characteristics

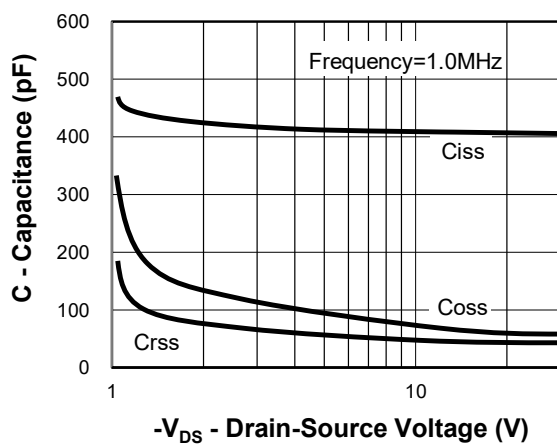


Fig 10. Capacitance Characteristics

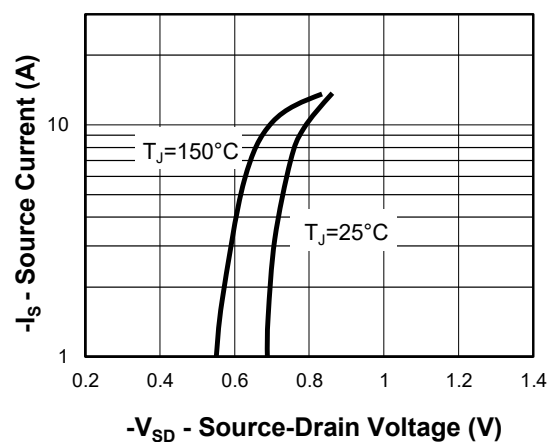
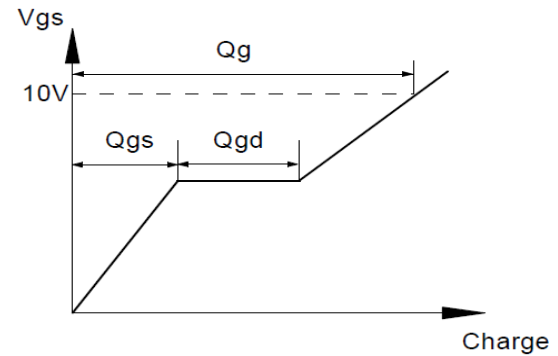
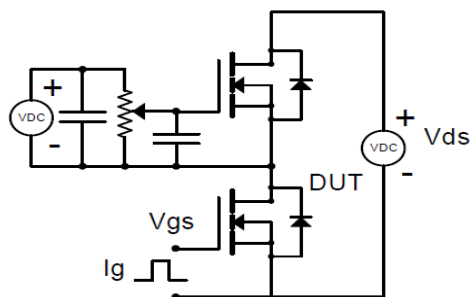
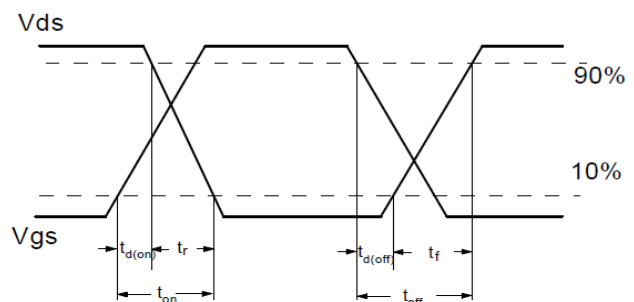
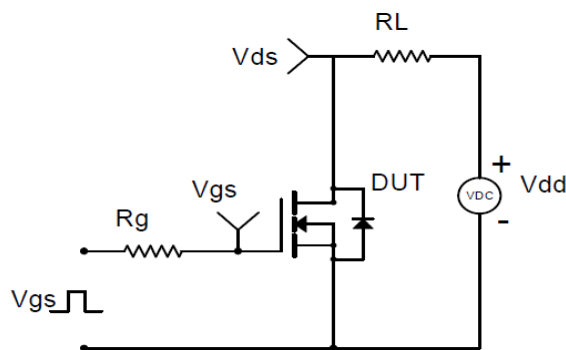


Fig 11. Source-Drain Diode Forward

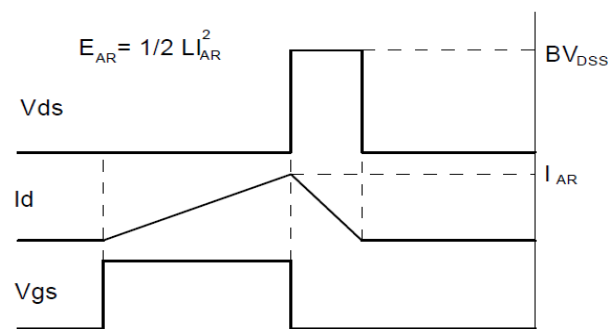
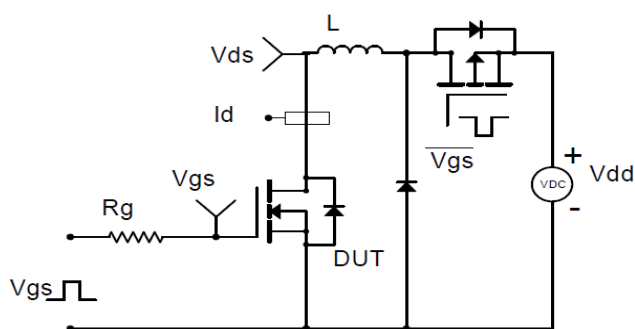
Test Circuit & Waveform



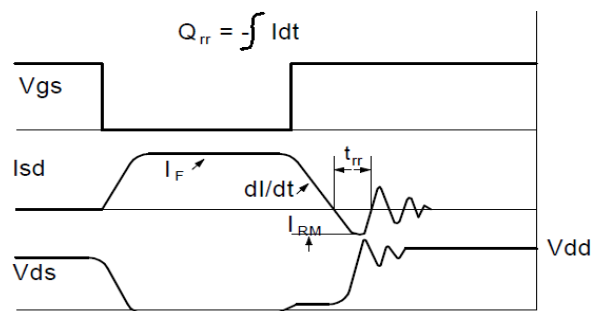
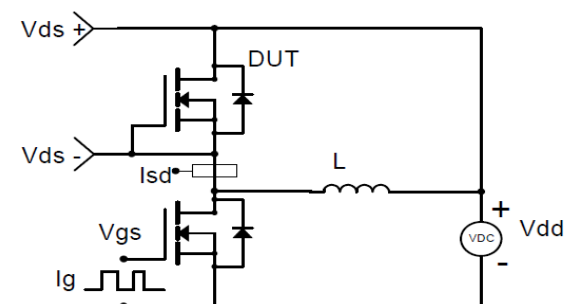
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



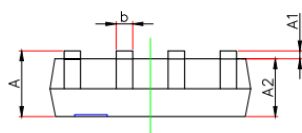
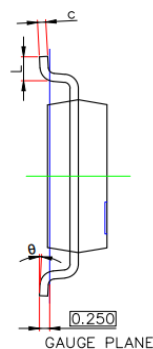
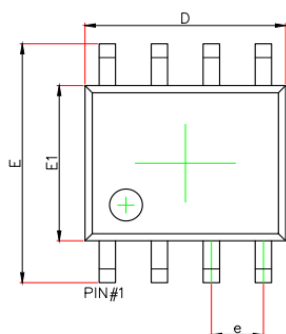
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

Product dimension

SOP-8



DIM	UNITS (mm)		
	MIN.	TYP.	MAX.
A	1.350	—	1.750
A1	0.100	—	0.250
A2	1.350	1.450	1.550
b	0.330	—	0.510
c	0.170	—	0.250
D	4.800	4.900	5.000
e	1.270(BSC)		
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.400	—	1.270
θ	0°	—	8°