

P-Channel 40 V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
- 40	265 at V _{GS} = - 10 V	- 1	1.5 nC
	380 at V _{GS} = - 4.5 V		

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested
- Lead Free

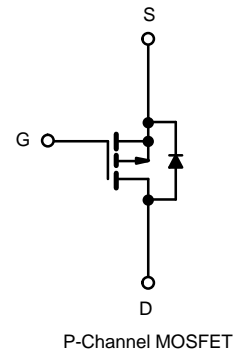
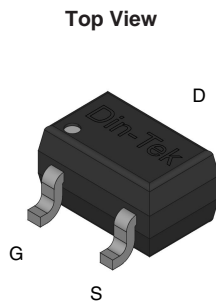


RoHS
COMPLIANT

APPLICATIONS

- Power Management
- PWM Application
- Load Switch

SOT-23 Pin Configuration



ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	- 40	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150° C) ^a	I _D	T _C = 25 °C	- 1
		T _C = 100 °C	- 0.65
Pulsed Drain Current ^b	I _{DM}	- 4	A
Maximum Power Dissipation ^c	P _D	T _C = 25 °C	0.8
		T _C = 100 °C	0.32
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to + 150	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Case (Drain)	R _{thJC}	156	°C/W

Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_d is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 0.5	-	- 1.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 40 V, V _{GS} = 0 V	-	-	- 1	μA
		V _{DS} = - 32V, V _{GS} = 0 V, T _J = 55 °C	-	-	- 10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ - 5 V, V _{GS} = - 10 V	- 1	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 1.5 A	-	265	345	mΩ
		V _{GS} = - 4.5 V, I _D = - 1 A	-	380	500	
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = - 20 V, f = 1 MHz	-	91	-	pF
Output Capacitance	C _{oss}		-	11	-	
Reverse Transfer Capacitance	C _{rss}		-	9	-	
Total Gate Charge ^c	Q _g	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 2 A	-	1.5	-	nC
Gate-Source Charge ^c	Q _{gs}		-	0.4	-	
Gate-Drain Charge ^c	Q _{gd}		-	0.45	-	
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 15 V, R _g = 3 Ω, I _D = - 1 A, V _{GS} = - 10 V	-	8.8	-	ns
Rise Time ^c	t _r		-	19	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	44	-	
Fall Time ^c	t _f		-	38	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T_C = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	-	-	- 1	A
Pulsed Current	I _{SM}		-	-	- 4	A
Forward Voltage ^a	V _{SD}	I _F = - 1 A, V _{GS} = 0 V	-	-	-1.2	V
Reverse Recovery Time	t _{rr}	I _F = - 1 A, di/dt = 100 A/μs	-	13	-	ns
Reverse Recovery Charge	Q _{rr}		-	5.5	-	nC

Notes

- Pulse test; pulse width ≤ 200 μs, duty cycle ≤ 2 %.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Test Circuit

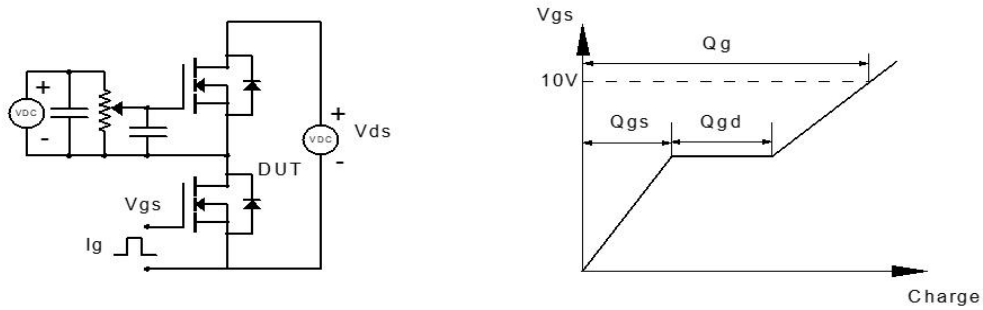


Figure 1: Gate Charge Test Circuit & Waveform

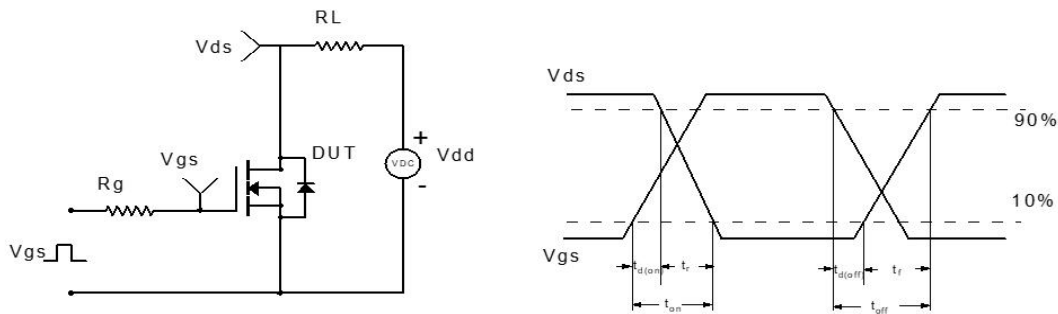


Figure 2: Resistive Switching Test Circuit & Waveform

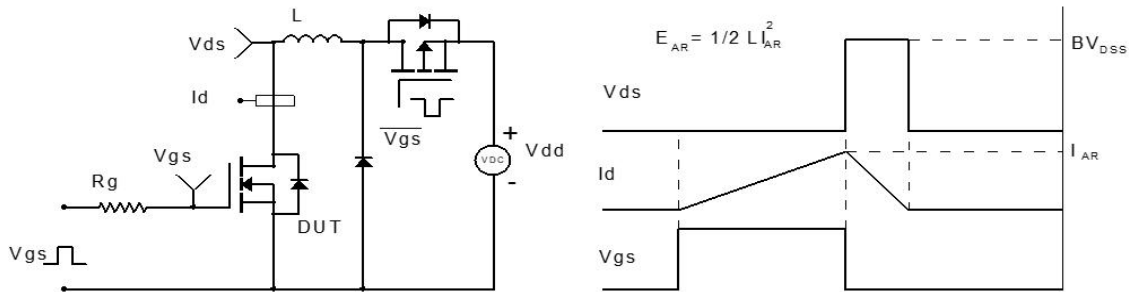


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

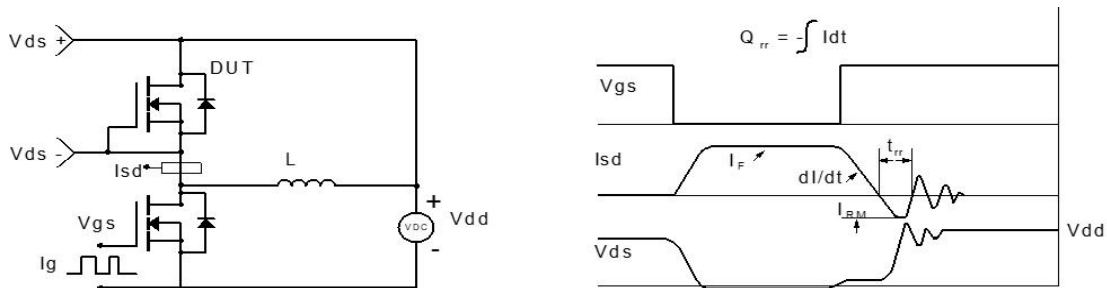
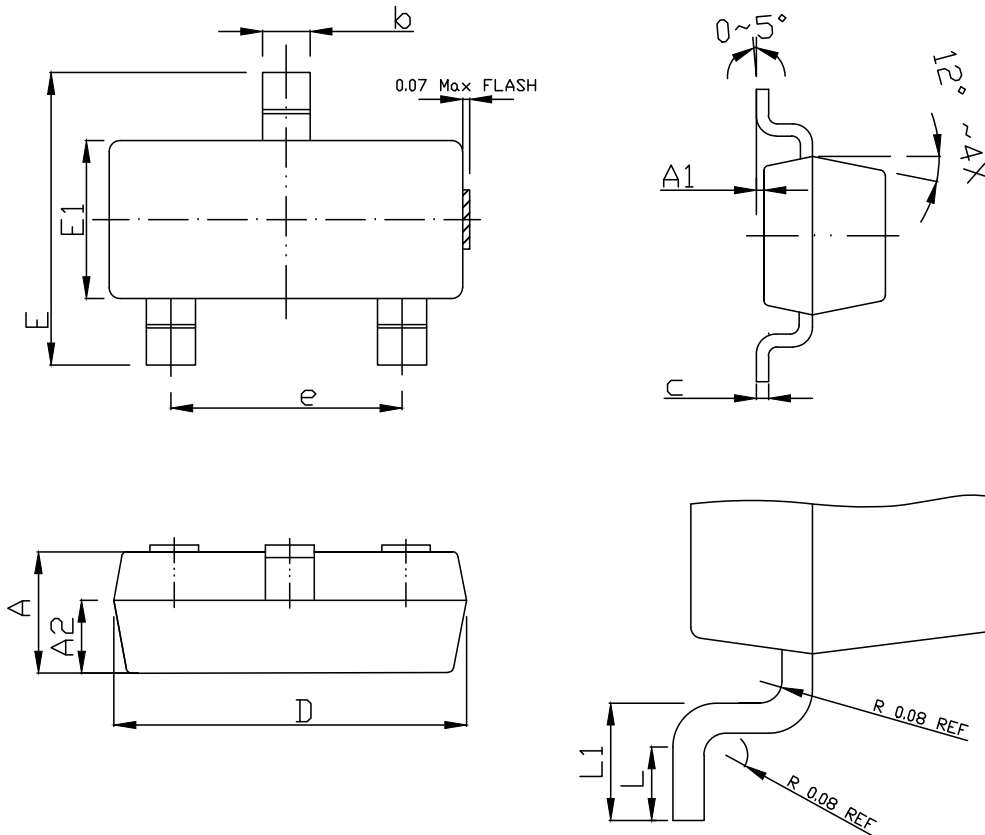


Figure 4: Diode Recovery Test Circuit & Waveform

SOT-23 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.80	1.00	1.30
A1	0.00	0.05	0.15
b	0.25	0.40	0.55
c	0.11 BSC		
D	2.60	2.90	3.20
E	2.10	2.40	2.70
E1	1.10	1.30	1.48
e	1.90 BSC		
L	0.17	-	-
L1	0.28	0.40	0.53
A2	0.60 REF		

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