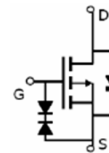


P Channel Plastic-Encapsulate MOSFETS
PRIMARY CHARACTERISTICS

$V_{(BR)DSS}$	$R_{DS(on)Max}$	I_D
-20V	38m Ω (Typ.)@-4.5V	-4A
	48m Ω (Typ.)@-2.5V	

SOT-23 PACKAGE

Marking : 3415


FEATURES

- High Power and Current Handling Capability
- Surface Mount Package
- ESD Rating: HBM 2.0KV

MECHANICAL DATA

- Case : Molded plastic, SOT-23
- Polarity : Shown above
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Epoxy : UL94-V0 rated flame retardant

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 8	V
I_D	Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	-4	A
		$T_C = 100^{\circ}\text{C}$	-2.6	
I_{DM}	Pulsed Drain Current ^{note1}		-20	A
P_D	Power Dissipation	$T_A = 25^{\circ}\text{C}$	1.67	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		75	$^{\circ}\text{C}/\text{W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^{\circ}\text{C}$

P Channel Plastic-Encapsulate MOSFETS
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±8V	-	-	±10	μA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-	-1.0	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} =-4.5V, I _D =-4A	-	38	48	mΩ
		V _{GS} =-2.5V, I _D =-3A	-	48	65	
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D = -4A	8	-	-	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	-	200	-	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -10V, V _{GS} = 0V, f = 1.0MHz	-	950	-	pF
C _{oss}	Output Capacitance		-	165	-	pF
C _{rss}	Reverse Transfer Capacitance		-	120	-	pF
Q _g	Total Gate Charge	V _{DS} = -10V, I _D = -4A, V _{GS} = -4.5V	-	12	-	nC
Q _{gs}	Gate-Source Charge		-	1.4	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	3.6	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, V _{GS} =-4.5A, R _L =2.5Ω,R _{GEN} =3Ω	-	12	-	ns
t _r	Turn-on Rise Time		-	10	-	ns
t _{d(off)}	Turn-off Delay Time		-	19	-	ns
t _f	Turn-off Fall Time		-	25	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-4	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-20	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = -4A	-	-	-1.2	V

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

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

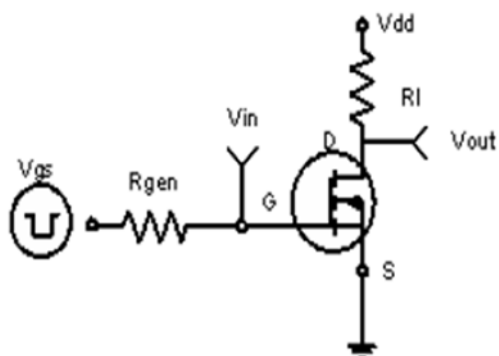


Figure1 :Switching Test Circuit

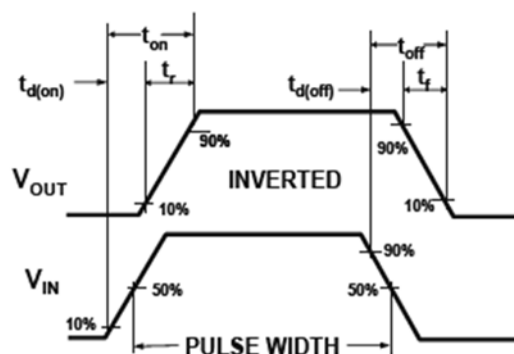
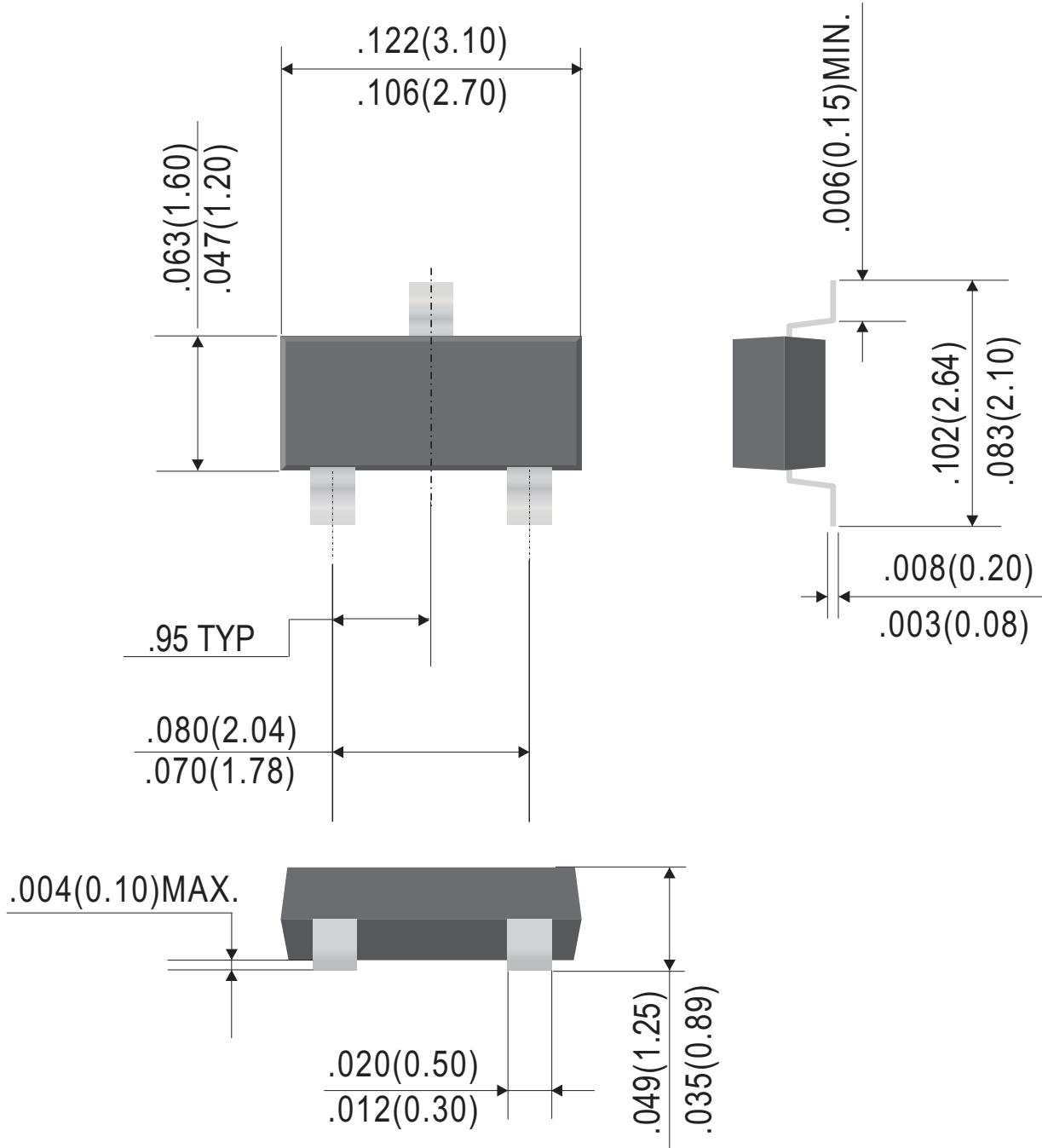


Figure2:Switching Waveforms

Outline Drawing

SOT-23

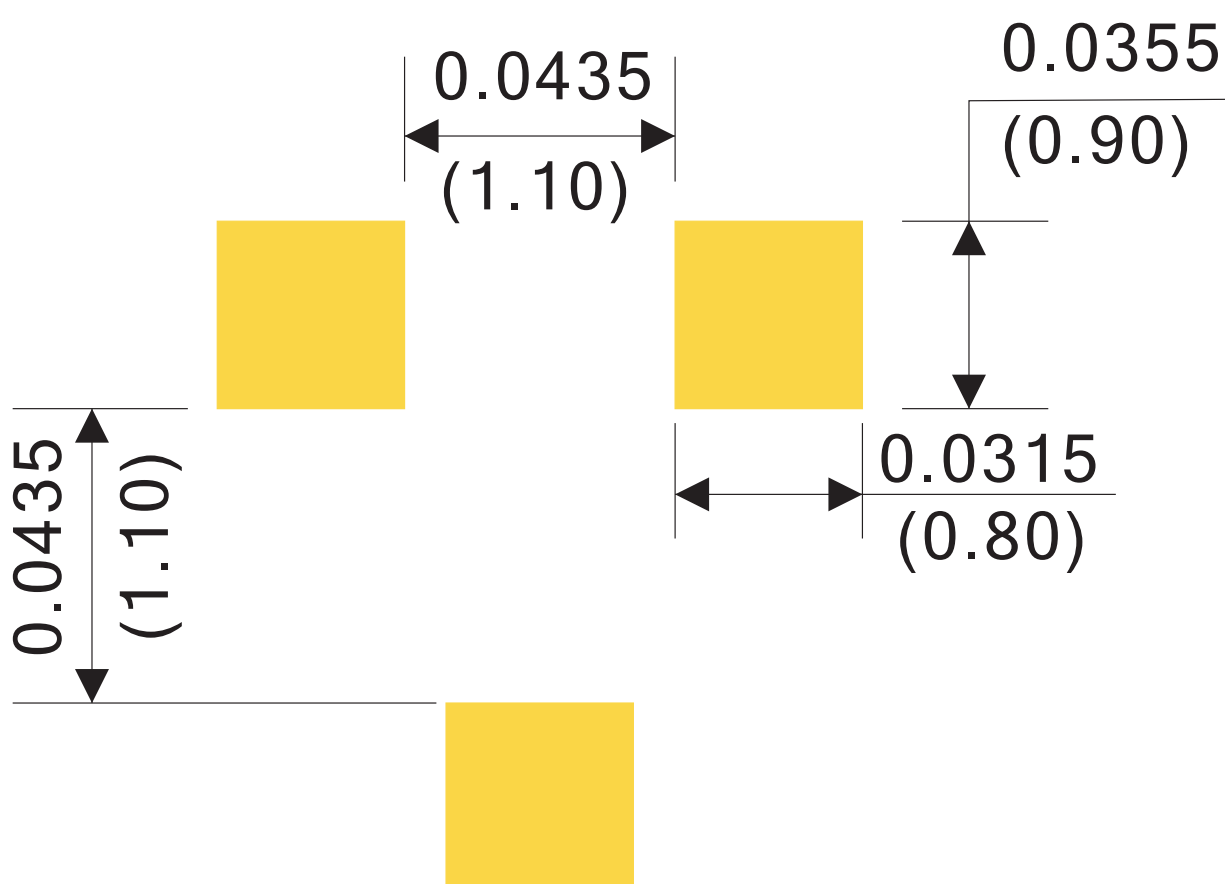


Dimensions in inches and (millimeters)

Rev.E

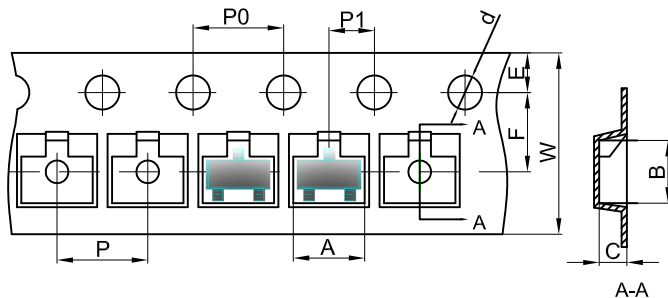
Suggested Soldering Pad Layout

SOT-23



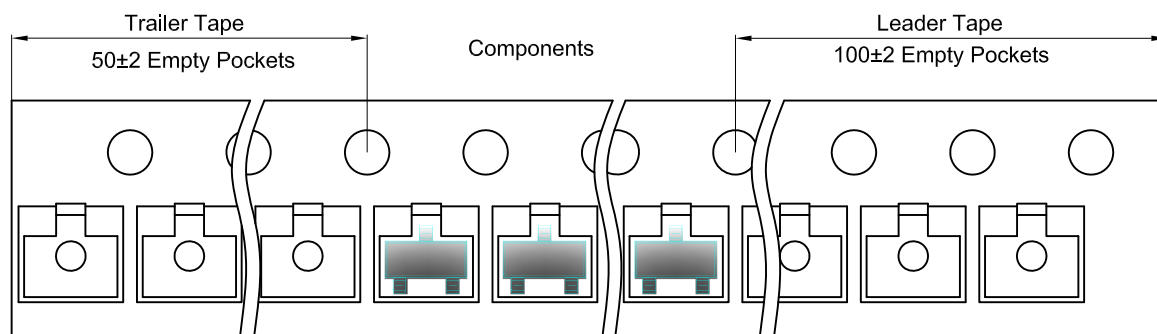
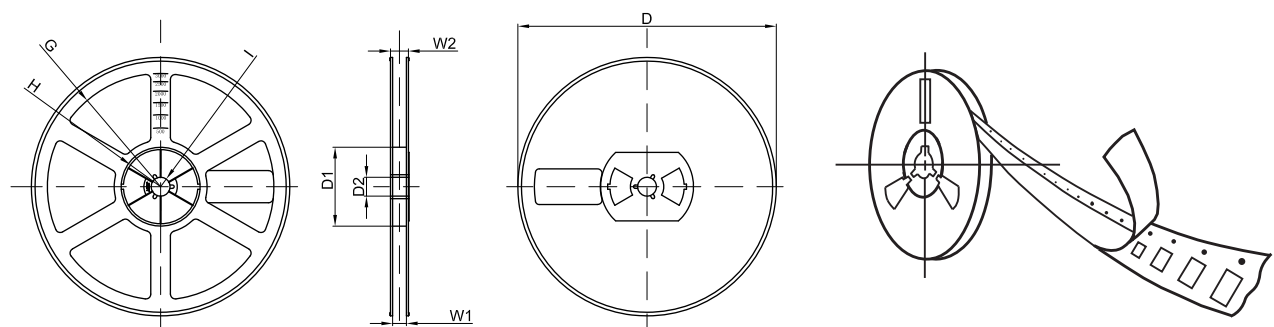
Dimensions in inches and (millimeters)

RevA

P Channel Plastic-Encapsulate MOSFETS
SOT-23 Embossed Carrier Tape

Packaging Description:

SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer

SOT-23 Reel


Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

Ordering Information:

Device PN	Packing
SE3415JM -T ⁽¹⁾ H ⁽²⁾ -WS	Tape&Reel: 3 Kpcs/Reel

Note: (1) Packing code, Tape & Reel

(2) Halogen free product for packing code suffix "H"

*****Disclaimer*****

WILLAS reserves the right to make changes without notice to any product specification herein, to make corrections, modifications, enhancements or other changes. WILLAS or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies. Data sheet specifications and its information contained are intended to provide a product description only. "Typical" parameters which may be included on WILLAS data sheets and/ or specifications can and do vary in different applications and actual performance may vary over time. WILLAS does not assume any liability arising out of the application or use of any product or circuit.

This is the preliminary specification. WILLAS products are not designed, intended or authorized for use in medical, life-saving implant or other applications intended for life-sustaining or other related applications where a failure or malfunction of component or circuitry may directly or indirectly cause injury or threaten a life without expressed written approval of WILLAS. Customers using or selling WILLAS components for use in such applications do so at their own risk and shall agree to fully indemnify WILLAS Inc and its subsidiaries harmless against all claims, damages and expenditures.