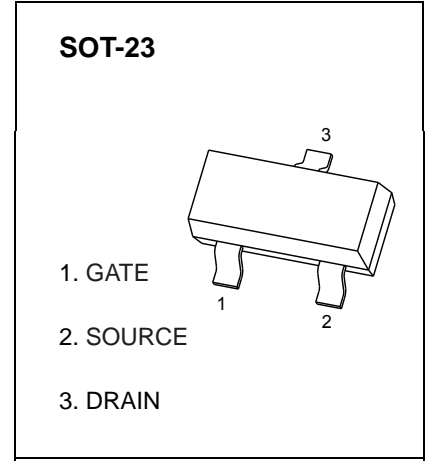


## 4459 P-Channel MOSFET

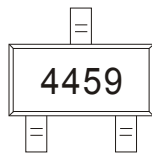
$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-30V	46m $\Omega$ @-10V	-5A
	72m $\Omega$ @-4.5V	



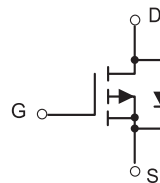
### DESCRIPTION

The 4459 combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

### MARKING



### Equivalent Circuit



### MAXIMUM RATINGS ( $T_a=25^{\circ}C$ unless otherwise noted)

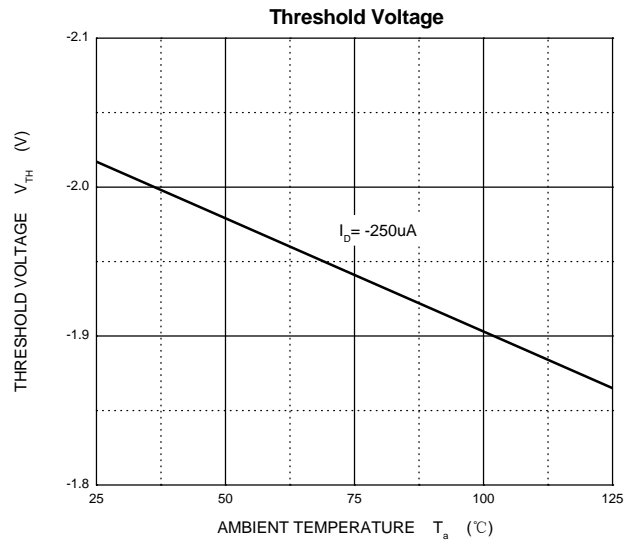
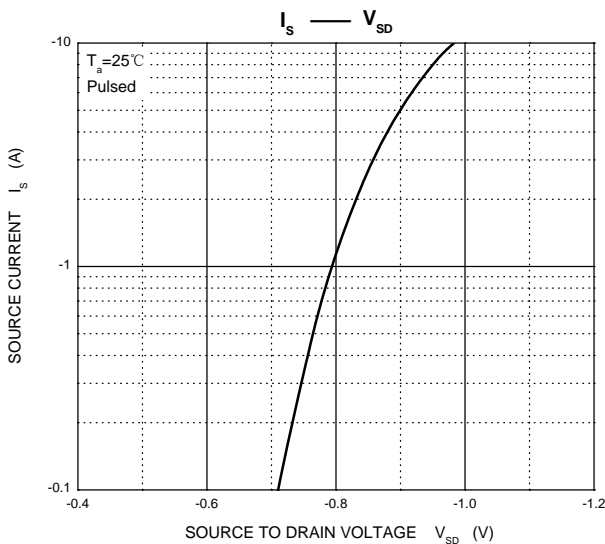
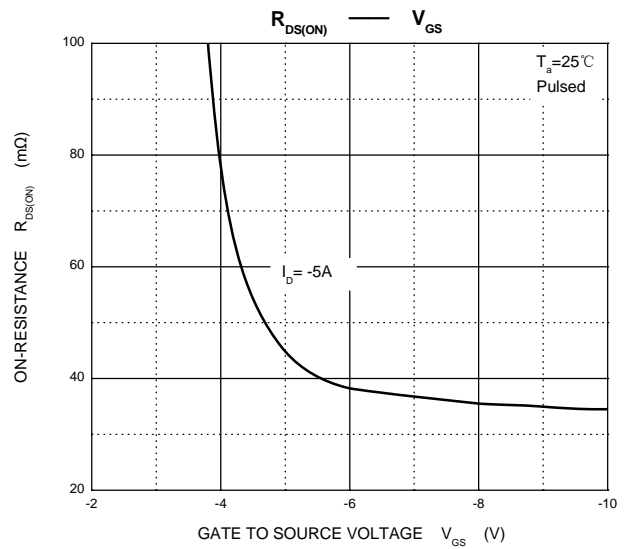
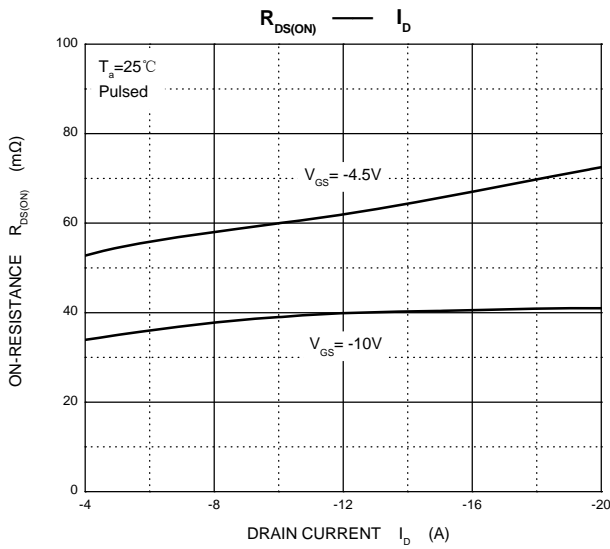
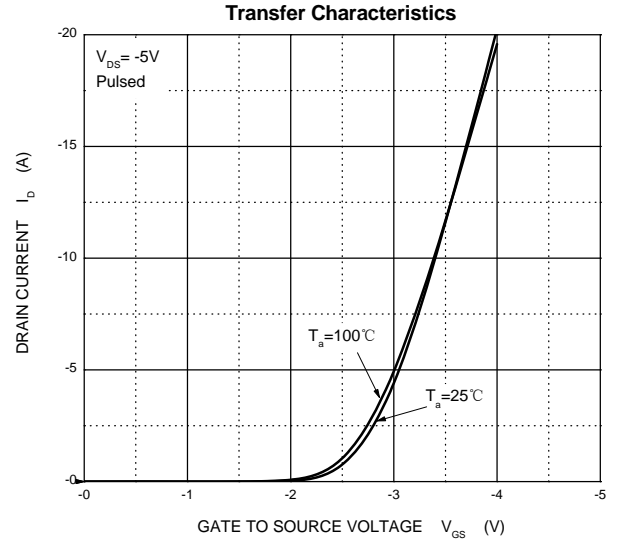
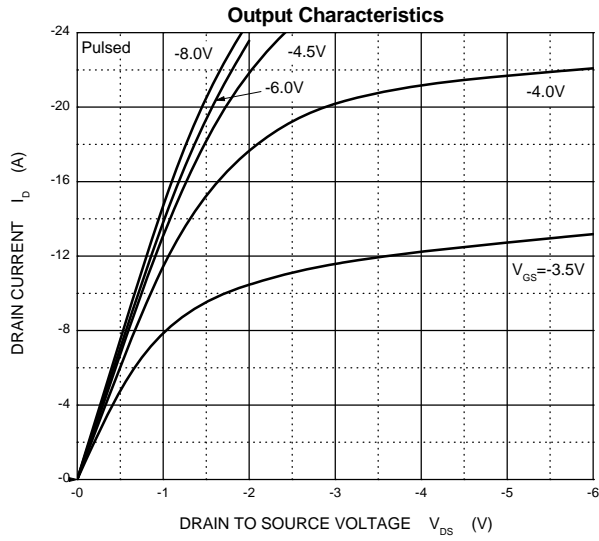
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-5.0	A
Pulsed Drain Current (note 1)	$I_{DM}$	-30	A
Power Dissipation (note 2)	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient ( $t \leq 10s$ ) (note 2)	$R_{\theta JA}$	357	$^{\circ}C/W$
Operation Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~ 150	$^{\circ}C$

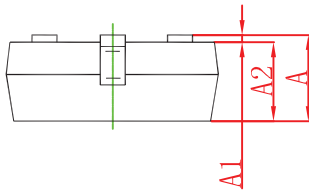
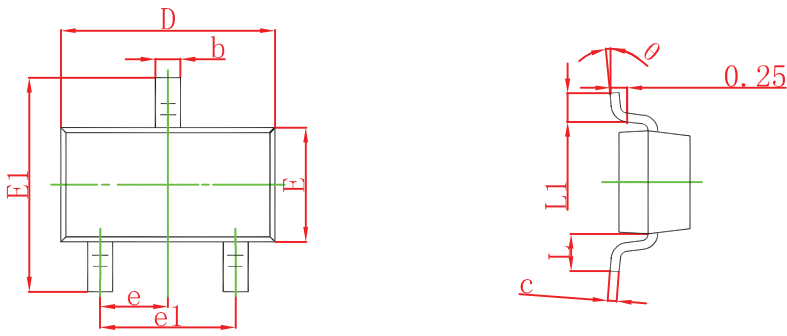
$T_a=25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -30V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage (note 3)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.4	-2.0	-2.4	V
Drain-source on-resistance (note 3)	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5A$		35	46	$m\Omega$
		$V_{GS} = -4.5V, I_D = -5A$		55	72	$m\Omega$
Forward tranconductance (note 3)	$g_{FS}$	$V_{DS} = -5V, I_D = -5A$		14		S
Diode forward voltage (note 3)	$V_{SD}$	$I_S = -1A, V_{GS} = 0V$			-1	V
<b>DYNAMIC PARAMETERS (note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$	415		625	pF
Output Capacitance	$C_{oss}$		70		130	pF
Reverse Transfer Capacitance	$C_{rss}$		40		90	pF
<b>SWITCHING PARAMETERS (note 4)</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = -10V, V_{DS} = -15V,$ $R_L = 2.5\Omega, R_{GEN} = 3\Omega$		7.5		ns
Turn-on rise time	$t_r$			5.5		ns
Turn-off delay time	$t_{d(off)}$			19		ns
Turn-off fall time	$t_f$			7		ns
Total Gate Charge (10V)	$Q_g$	$V_{DS} = -15V, V_{GS} = -10V, I_D = -5A$	7.4		11	nC
Gate-Source Charge	$Q_{gs}$		1.3		1.9	nC
Gate-Drain Charge	$Q_{gd}$		1.3		3.1	nC

**Notes :**

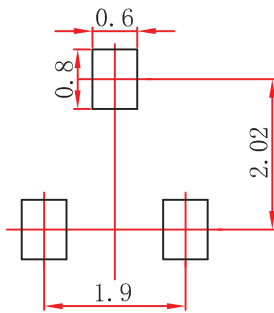
1. Repetitive rating : Pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ . The power dissipation  $P_D$  is based on  $T_{J(MAX)} = 150^\circ\text{C}$ , using  $\leq 10s$  junction-to-ambient thermal resistance.
2. The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$ .
4. These parameters have no way to verify.





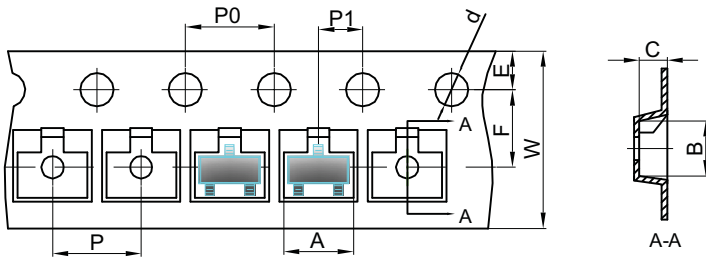
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

## SOT-23 Suggested Pad Layout



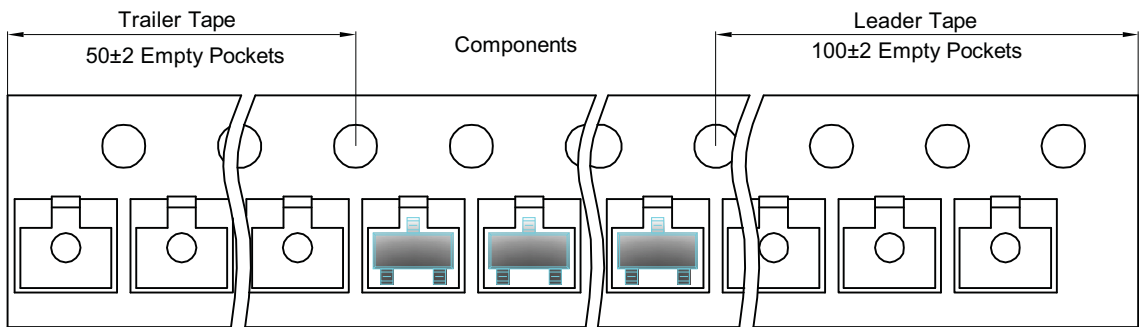
- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.

### SOT-23 Embossed Carrier Tape

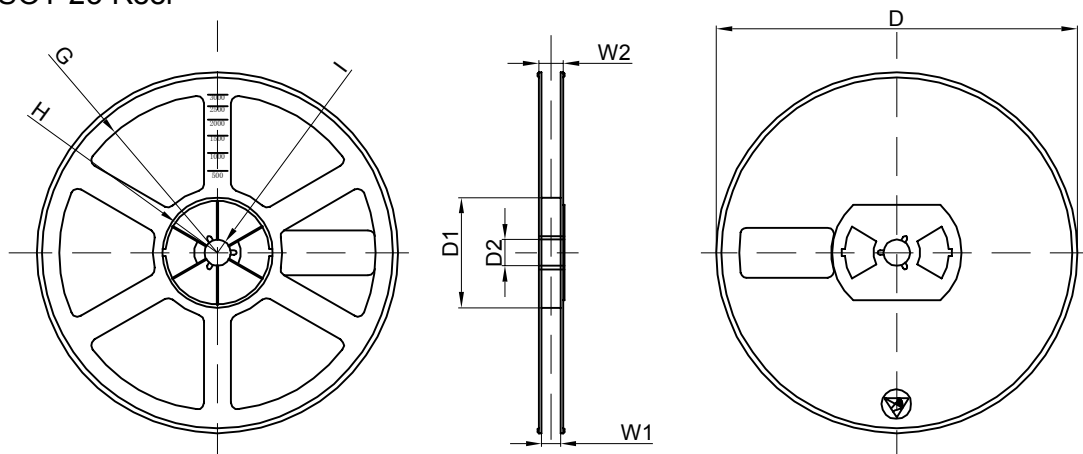


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

### 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

REEL	Reel Size					
3000 pcs	7 inch					