

P-Channel Power MOSFET

-20V, -6.5A, 26mΩ

FEATURES

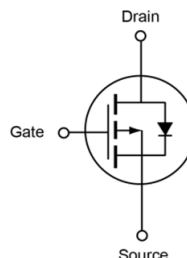
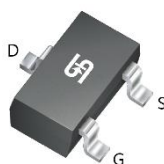
- Fast switching
- Suitable for -1.8V Gate Drive Applications
- Pb-free plating
- RoHS Compliant
- Halogen-free

APPLICATIONS

- Battery Pack
- Portable Devices
- High-side loadswitch

KEY PERFORMANCE PARAMETERS

PARAMETER		VALUE	UNIT
V_{DS}		-20	V
$R_{DS(on)}$ (max)	$V_{GS} = -4.5V$	26	mΩ
	$V_{GS} = -2.5V$	32	
	$V_{GS} = -1.8V$	40	
Q_g		17	nC


SOT-23

Note: MSL 3 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 10	V
Continuous Drain Current	$T_A = 25^\circ\text{C}$	I_D	-6.5	A
	$T_A = 100^\circ\text{C}$		-4.1	
Pulsed Drain Current (Note 1)		I_{DM}	-26	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$		P_D	1.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

THERMAL PERFORMANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Ambient Thermal Resistance (Note 2)	$R_{\theta JA}$	80	$^\circ\text{C/W}$

Notes:

1. Pulse Width $\leq 100\mu\text{s}$.
2. Device on a PCB FR4 with 1 in² (single layer, 2 oz thickness) copper area for drain connection.

ELECTRICAL SPECIFICATIONS (T _A = 25°C unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	BV _{DSS}	-20	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	V _{GS(TH)}	-0.3	-0.6	-1.0	V
Gate-Source Leakage Current	V _{GS} = ± 10V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Drain-Source Leakage Current	V _{DS} = -20V, V _{GS} = 0V	I _{DSS}	--	--	-1	μA
	V _{DS} = -16V, T _J = 125°C		--	--	-10	
Drain-Source On-State Resistance (Note 3)	V _{GS} = -4.5V, I _D = -5A	R _{DS(on)}	--	18	26	mΩ
	V _{GS} = -2.5V, I _D = -4A		--	22	32	
	V _{GS} = -1.8V, I _D = -3A		--	30	40	
Forward Transconductance (Note 3)	V _{DS} = -10V, I _D = -5A	g _{fs}	--	16	--	S
Dynamic (Note 4)						
Total Gate Charge	V _{DS} = -10V, I _D = -5A, V _{GS} = -4.5V	Q _g	--	17	--	nC
Gate-Source Charge		Q _{gs}	--	2.4	--	
Gate-Drain Charge		Q _{gd}	--	3.7	--	
Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	1645	--	pF
Output Capacitance		C _{oss}	--	209	--	
Reverse Transfer Capacitance		C _{rss}	--	150	--	
Switching (Note 5)						
Turn-On Delay Time	V _{DD} = -10V, R _G = 25Ω, I _D = -1A, V _{GS} = -4.5V	t _{d(on)}	--	9.6	--	ns
Turn-On Rise Time		t _r	--	16	--	
Turn-Off Delay Time		t _{d(off)}	--	104	--	
Turn-Off Fall Time		t _f	--	50	--	
Source-Drain Diode						
Forward Voltage (Note 3)	I _S = -1A, V _{GS} = 0V	V _{SD}	--	--	-1	V

Notes:

- Pulse test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Defined by design. Not subject to production test.
- Switching time is essentially independent of operating temperature.

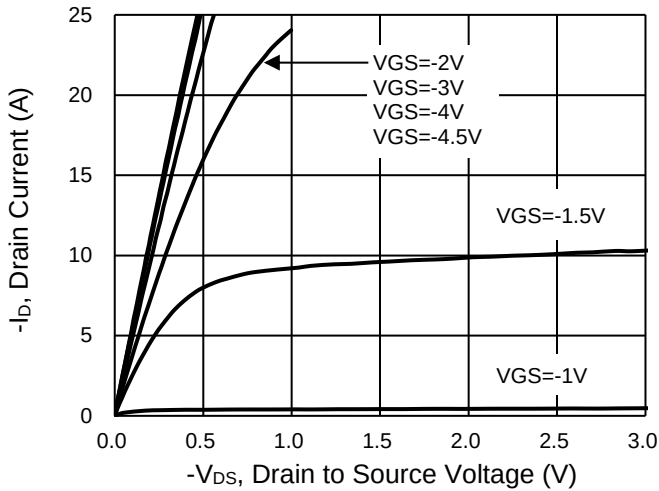
ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TSM260P02CX RFG	SOT-23	3000pcs / 7" Reel

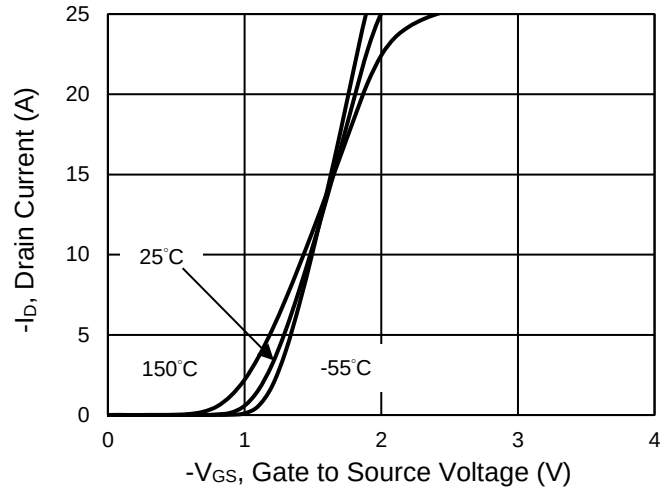
CHARACTERISTICS CURVES (P-Channel)

($T_A = 25^\circ\text{C}$ unless otherwise noted)

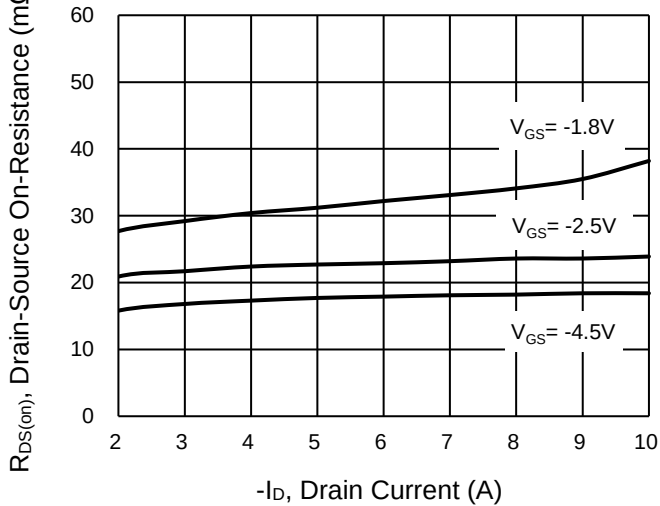
Output Characteristics



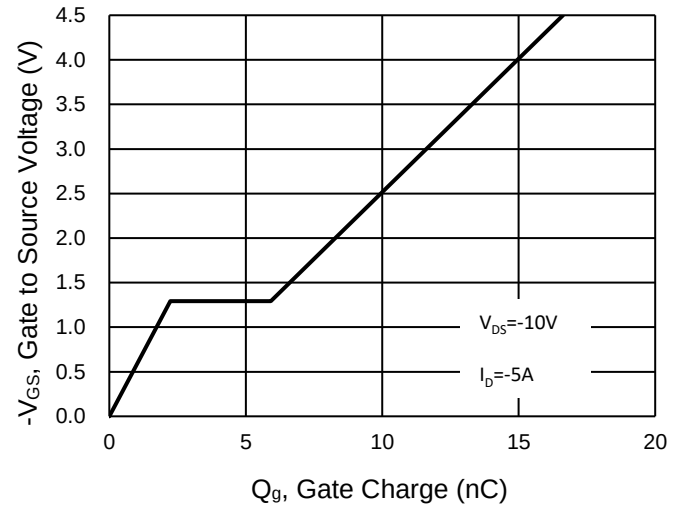
Transfer Characteristics



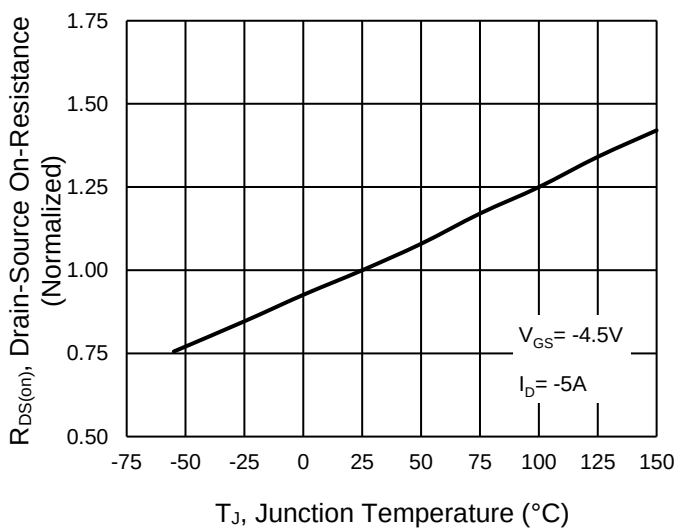
On-Resistance vs. Drain Current



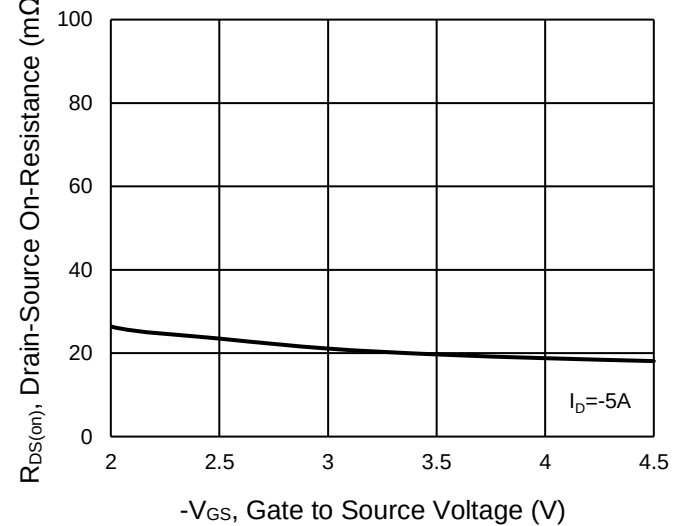
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature

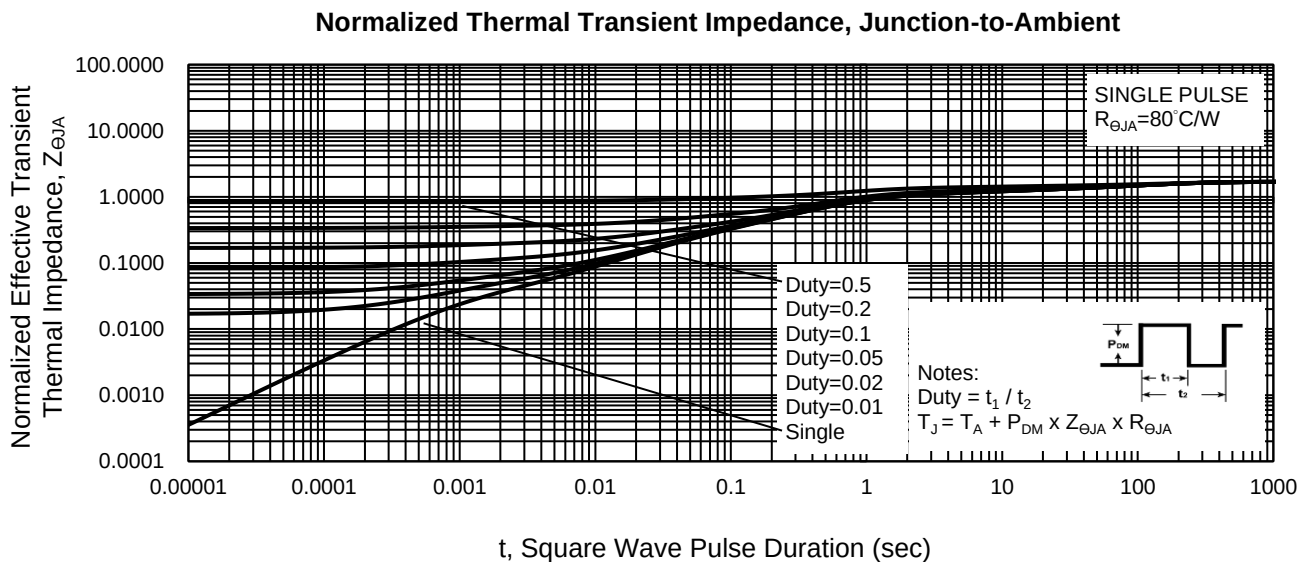
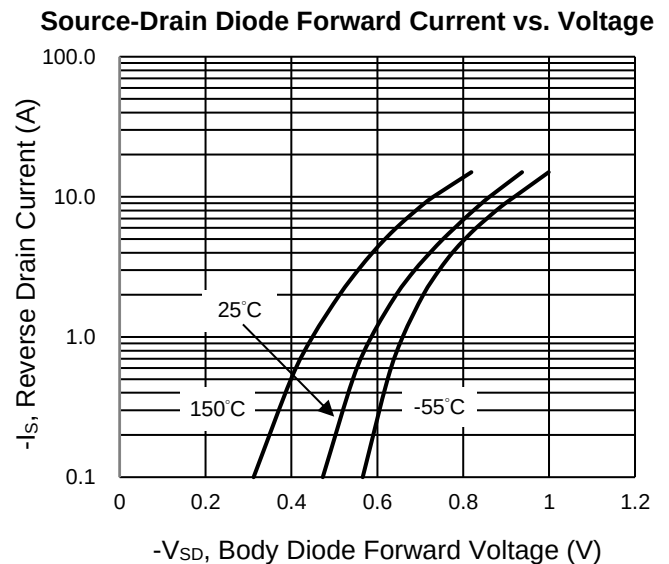
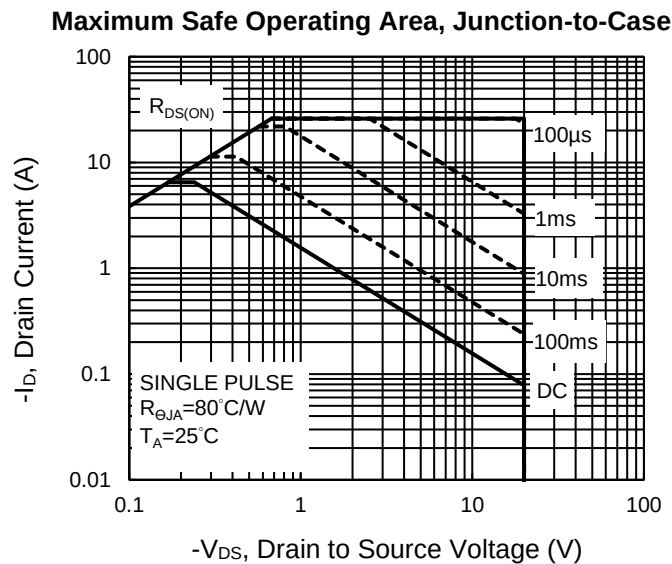
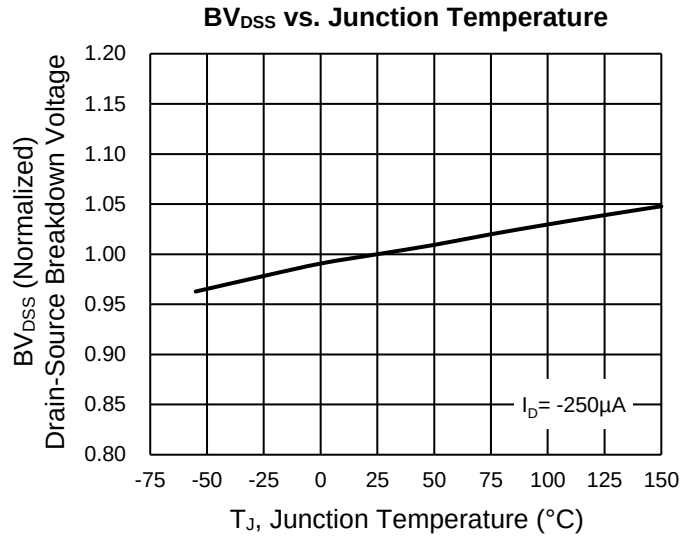
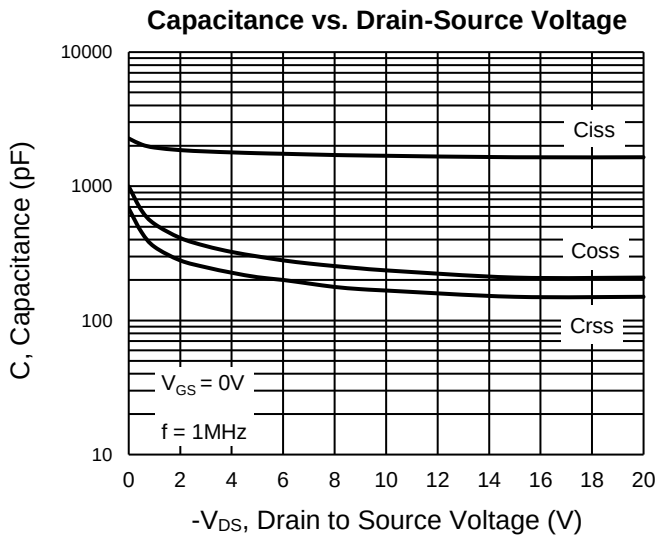


On-Resistance vs. Gate-Source Voltage



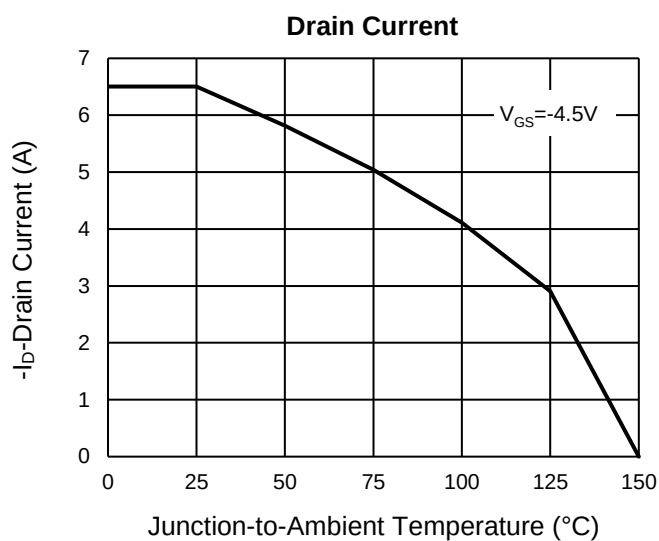
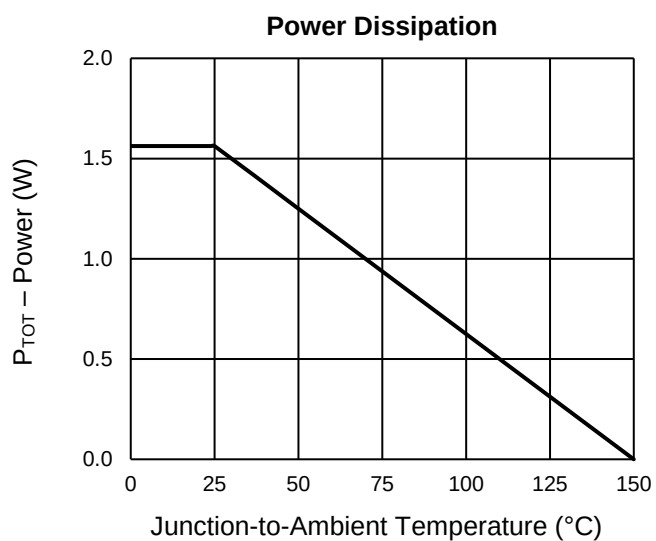
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($T_A = 25^\circ\text{C}$ unless otherwise noted)

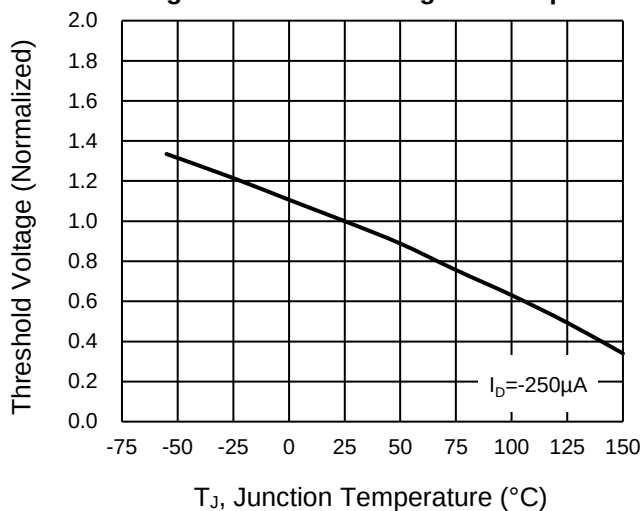


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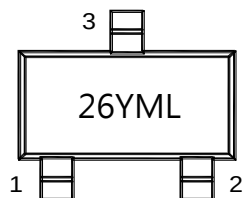
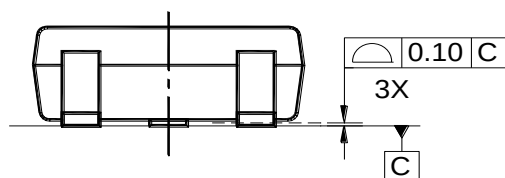
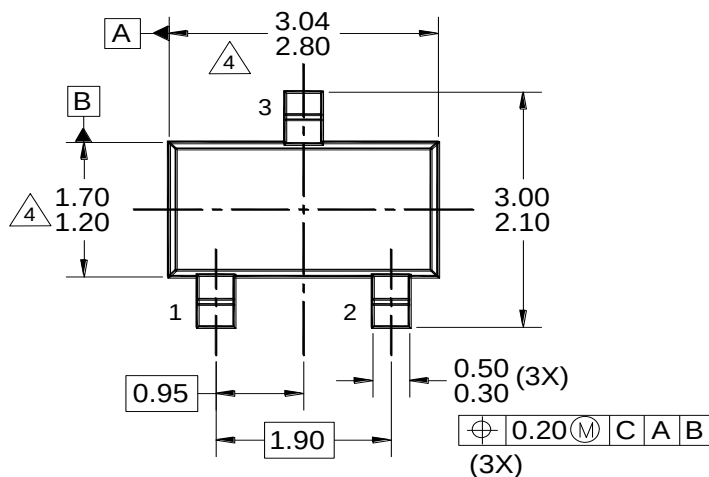


Normalized gate threshold voltage vs Temperature

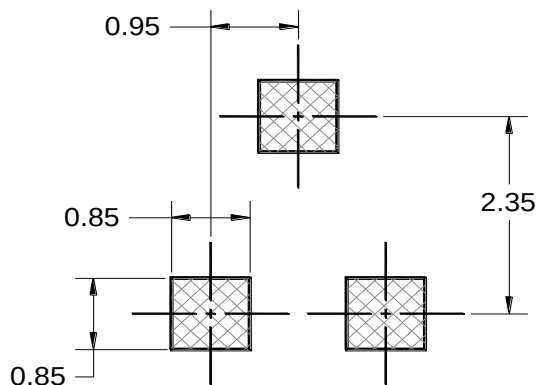
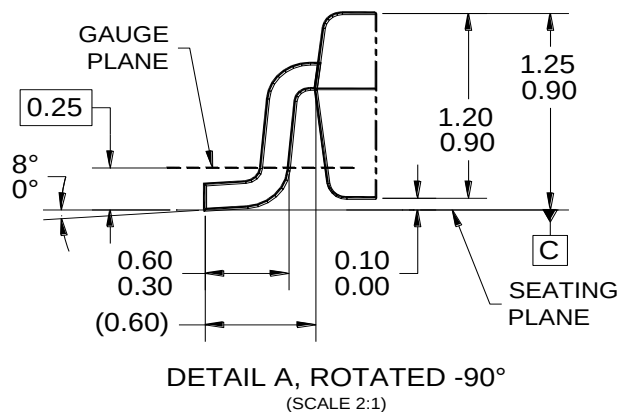
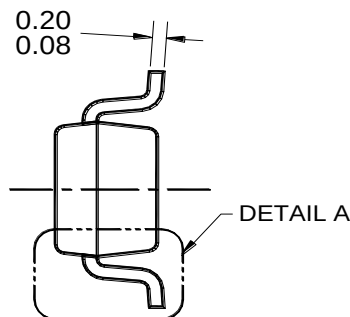


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

SOT-23



MARKING DIAGRAM



SUGGESTED PAD LAYOUT

Y = Year Code
M = Month Code for Halogen Free Product
O =Jan **P** =Feb **Q** =Mar **R** =Apr
S =May **T** =Jun **U** =Jul **V** =Aug
W =Sep **X** =Oct **Y** =Nov **Z** =Dec
L = Lot Code

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-236, ISSUE H, VARIATION AA.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SOT23-025 REV A.

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