

N-Channel Power MOSFET

FEATURES

- Low RDS(ON) 250mΩ (Max.)
- Low gate charge typical @ 3.9nC (Typ.)
- RoHS compliant
- Halogen-free

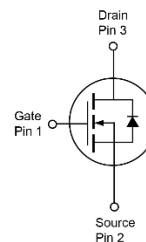
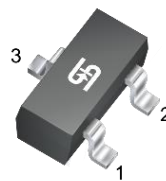
APPLICATIONS

- DC-DC Converters
- Power management functions

KEY PERFORMANCE PARAMETERS			
PARAMETER		VALUE	UNIT
V _{DS}		100	V
R _{DS(on)} (max)	V _{GS} = 10V	250	mΩ
Q _g		3.9	nC



SOT-23



Note: MSL 1 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	1.5	A
Pulsed Drain Current (Note 1)	I _{DM}	6	A
Total Power Dissipation	P _D	T _A = 25°C	1.04
		T _A = 70°C	0.67
Operating Junction and Storage Temperature Range	T _J , T _{STG}	- 55 to +150	°C

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Ambient Thermal Resistance (Note 2)	R _{θJA}	120	°C/W

Notes:

1. Pulse Width ≤ 100μs.
2. Device on a PCB FR4 with 1 in² (single layer, 2 oz thickness) copper area for drain connection.

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note 3)						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	100	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1	1.7	2.5	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 1.5A$	$R_{DS(on)}$	--	120	250	m Ω
Forward Transconductance	$V_{DS} = 10V, I_D = 0.4A$	g_{fs}	--	2.4	--	S
Dynamic (Note 4)						
Total Gate Charge	$V_{DS} = 50V, I_D = 1.5A,$ $V_{GS} = 10V$	Q_g	--	3.9	--	nC
Gate-Source Charge		Q_{gs}	--	0.6	--	
Gate-Drain Charge		Q_{gd}	--	1	--	
Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$	C_{iss}	--	142	--	pF
Output Capacitance		C_{oss}	--	32	--	
Reverse Transfer Capacitance		C_{rss}	--	13	--	
Switching (Note 5)						
Turn-On Delay Time	$V_{DD} = 50V, R_G = 6\Omega,$ $I_D = 1.5A, V_{GS} = 10V$	$t_{d(on)}$	--	3.2	--	ns
Turn-On Rise Time		t_r	--	132.2	--	
Turn-Off Delay Time		$t_{d(off)}$	--	12	--	
Turn-Off Fall Time		t_f	--	10	--	
Source-Drain Diode						
Forward Voltage (Note 3)	$I_S = 1.5A, V_{GS} = 0V$	V_{SD}	--	0.8	1.2	V

Notes:

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

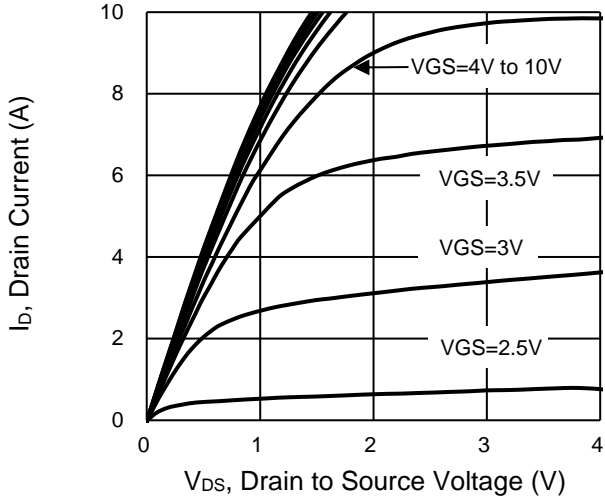
ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TSM2328CX RFG	SOT-23	3kpcs / 7" Reel

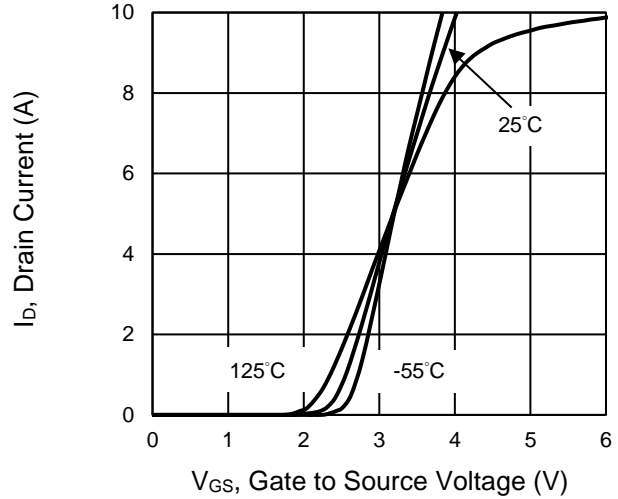
CHARACTERISTICS CURVES

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

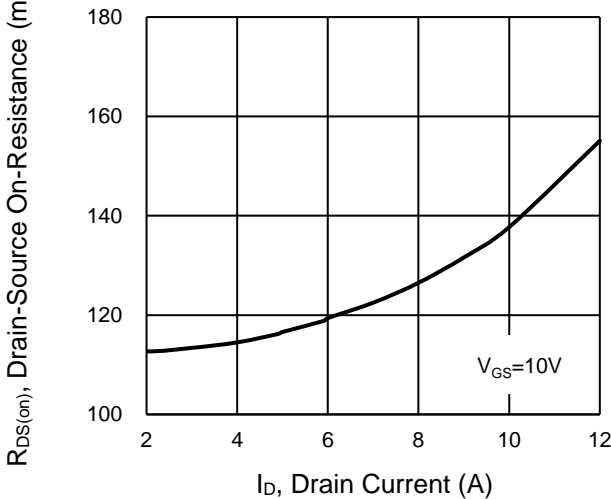
Output Characteristics



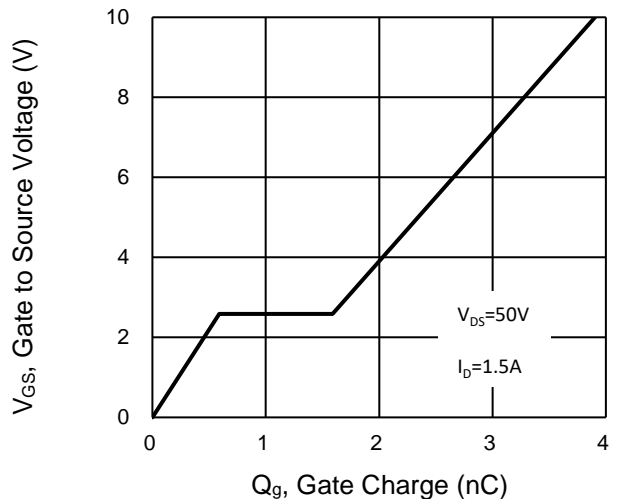
Transfer Characteristics



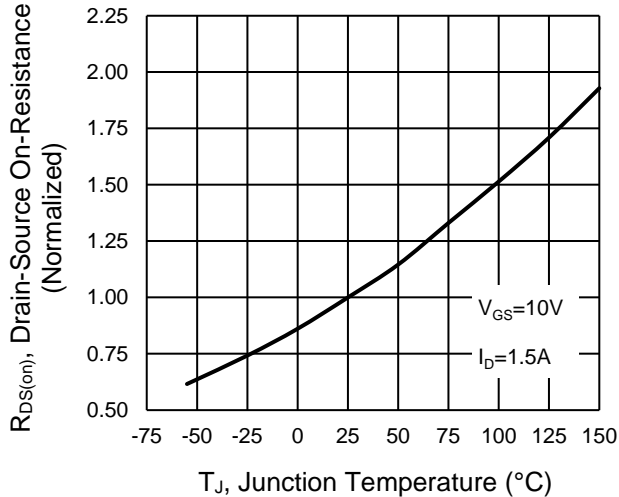
On-Resistance vs. Drain Current



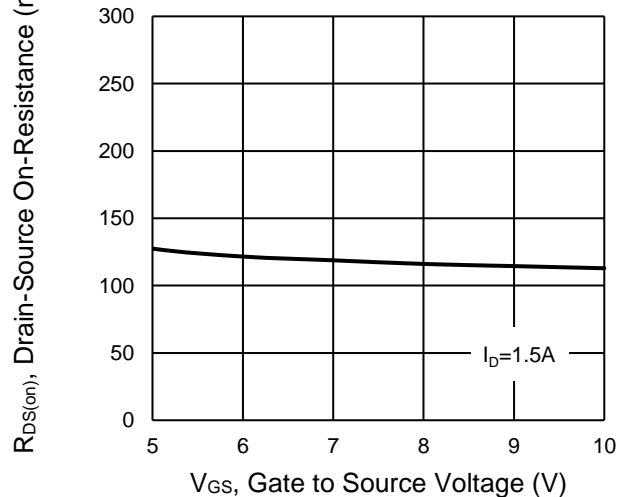
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature



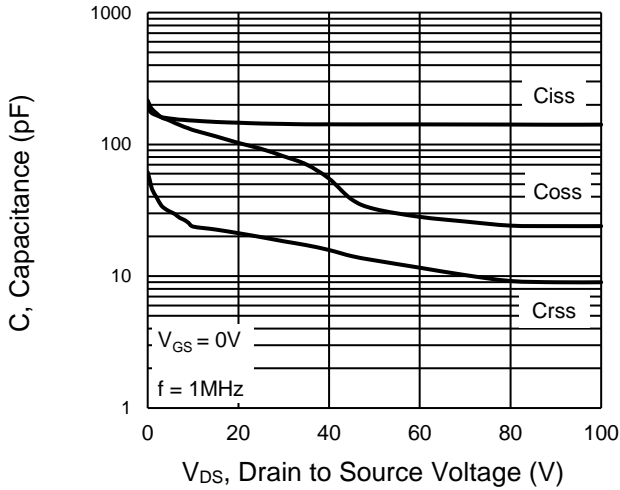
On-Resistance vs. Gate-Source Voltage



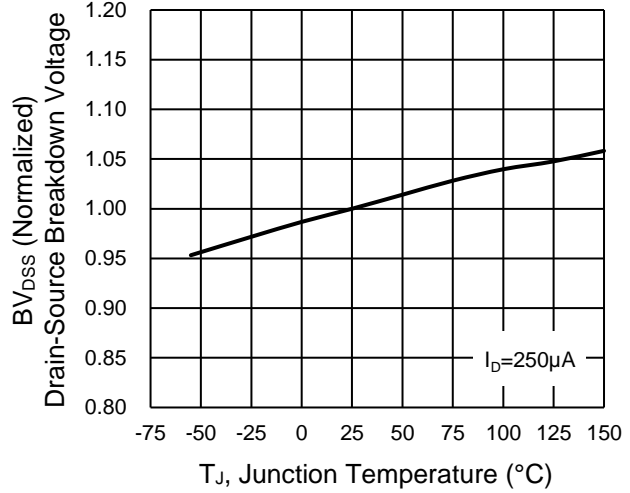
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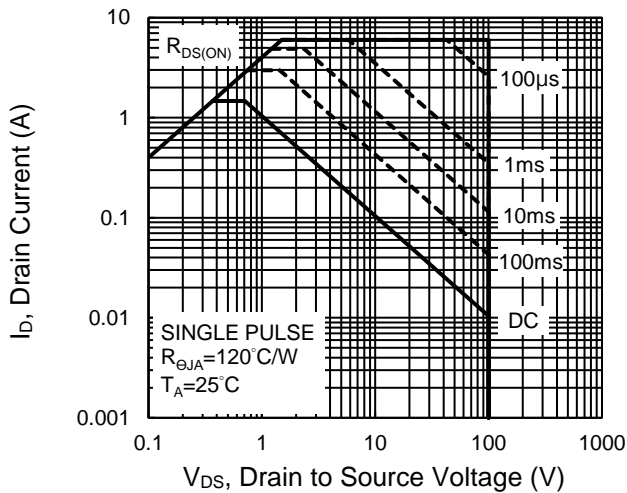
Capacitance vs. Drain-Source Voltage



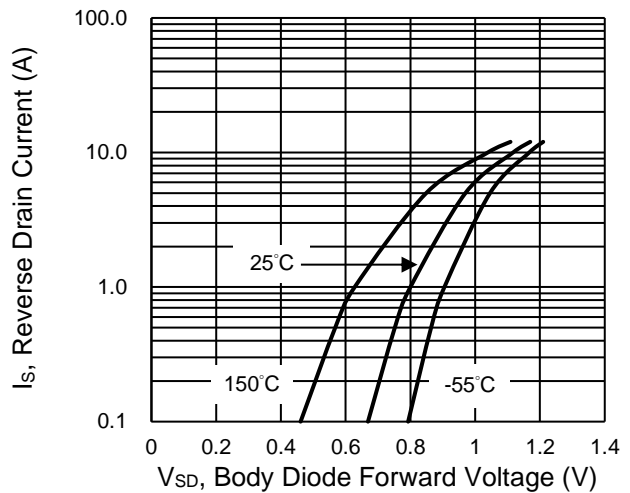
BV_{DSS} vs. Junction Temperature



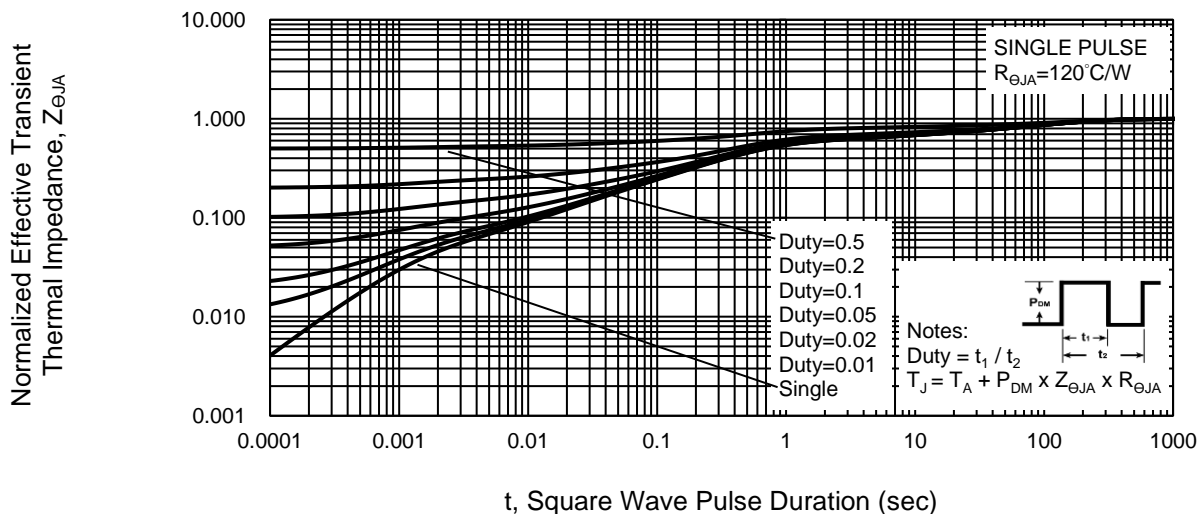
Maximum Safe Operating Area, Junction-to-Ambient



Source-Drain Diode Forward Current vs. Voltage



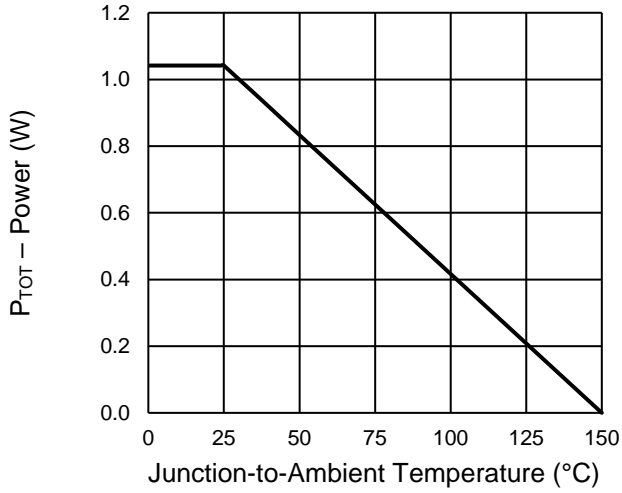
Normalized Thermal Transient Impedance, Junction-to-Ambient



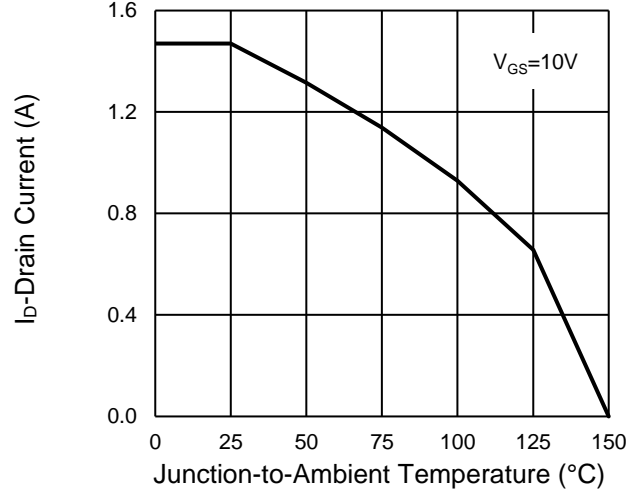
CHARACTERISTICS CURVES

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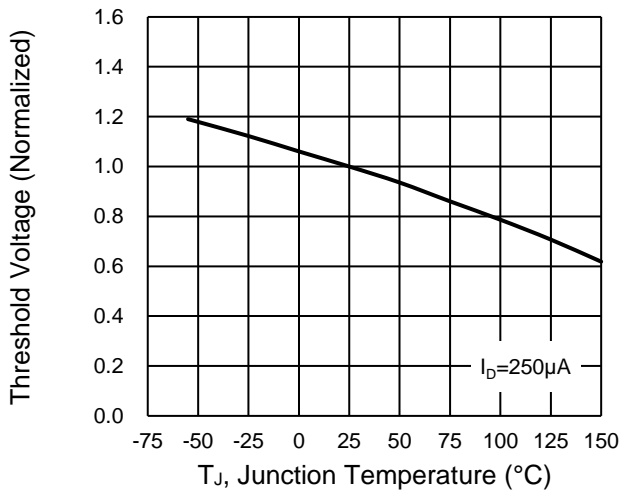
Power Dissipation



Drain Current

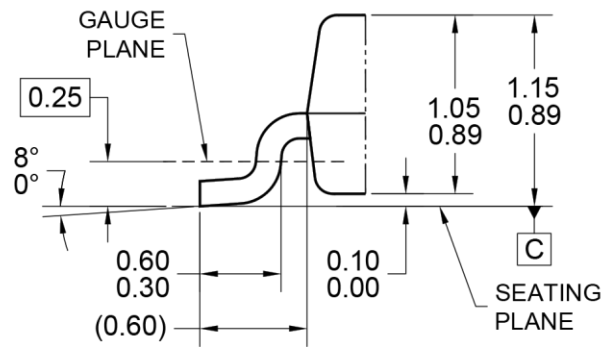
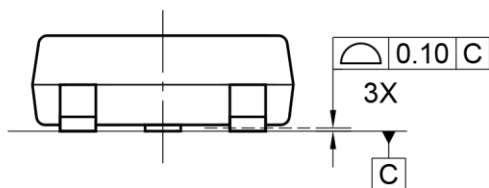
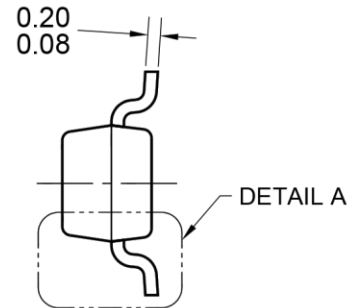
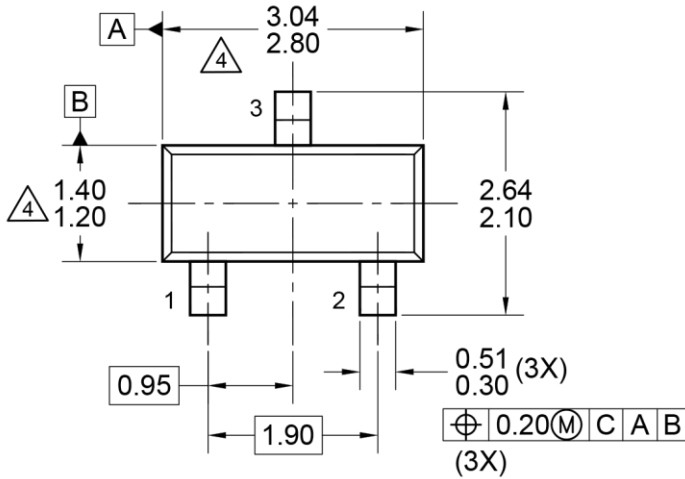


Normalized gate threshold voltage vs Temperature

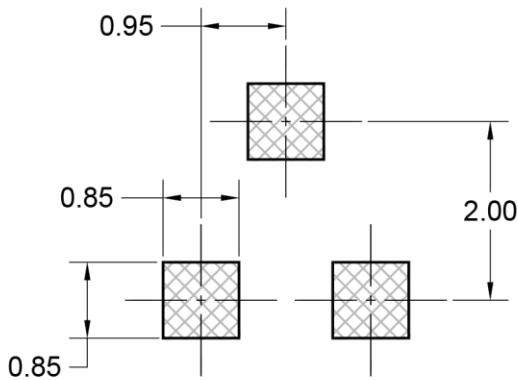


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

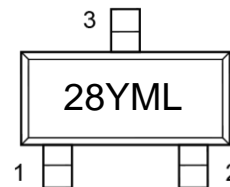
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DETAIL A, ROTATED -90°
(SCALE 2:1)



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

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-SOT23JEDEC-104 REV A.

- 28 = Device marking
- Y = Year Code
- M = Month Code for Halogen Free Product
(O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
- L = Lot Code

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