

N-Channel Power MOSFET

20V, 5.3A, 33mΩ

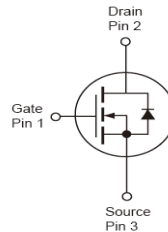
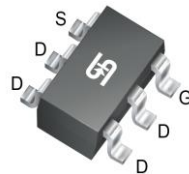
FEATURES

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance
- RoHS Compliant
- Halogen-free

APPLICATION

- Load Switch
- PA Switch

KEY PERFORMANCE PARAMETERS			
PARAMETER		VALUE	UNIT
V_{DS}		20	V
$R_{DS(on)}$ (max)	$V_{GS} = 4.5V$	33	mΩ
	$V_{GS} = 2.5V$	40	
Q_g		12.5	nC


SOT-26

Notes: Moisture sensitivity level: level 3. 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}	± 12	V
Continuous Drain Current (Note 1)	$T_C = 25^\circ\text{C}$	I_D	5.3	A
	$T_C = 100^\circ\text{C}$		3.1	
Pulsed Drain Current (Note 2)		I_{DM}	20	A
Total Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	2.0	W
	$T_A = 70^\circ\text{C}$		1.3	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +150	$^\circ\text{C}$

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	30	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	80	$^\circ\text{C/W}$

Notes: 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 (Note 3)						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	BV _{DSS}	20	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	V _{GS(TH)}	0.5	0.7	1.0	V
Gate Body Leakage	V _{GS} = ±10V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 16, V _{GS} = 0V	I _{DSS}	--	--	1.0	μA
Drain-Source On-State Resistance	V _{GS} = 4.5V, I _D = 5.3A	R _{DS(ON)}	--	27	33	mΩ
	V _{GS} = 2.5V, I _D = 4.4A		--	33	40	
Forward Transconductance	V _{DS} = 10V, I _D = 5.3A	g _{fs}	--	20	--	S
Dynamic (Note 4)						
Total Gate Charge	V _{DS} = 10V, I _D = 5.3A, V _{GS} = 4.5V	Q _g	--	12.5	--	nC
Gate-Source Charge		Q _{gs}	--	0.72	--	
Gate-Drain Charge		Q _{gd}	--	4.3	--	
Input Capacitance	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	700	--	pF
Output Capacitance		C _{oss}	--	125	--	
Reverse Transfer Capacitance		C _{rss}	--	110	--	
Switching (Note 5)						
Turn-On Delay Time	V _{DD} = 10V, R _L = 10Ω, I _D = 1A, V _{GEN} = 4.5V, R _G = 6Ω	t _{d(on)}	--	4.6	--	ns
Turn-On Rise Time		t _r	--	14	--	
Turn-Off Delay Time		t _{d(off)}	--	30	--	
Turn-Off Fall Time		t _f	--	5	--	
Source-Drain Diode (Note 3)						
Forward On Voltage	I _S = 1A, V _{GS} = 0V	V _{SD}	--	0.7	1.3	V

Notes:

1. Current limited by package
2. Pulse width limited by the maximum junction temperature
3. Pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$
4. For DESIGN AID ONLY, not subject to production testing.
5. Switching time is essentially independent of operating temperature.

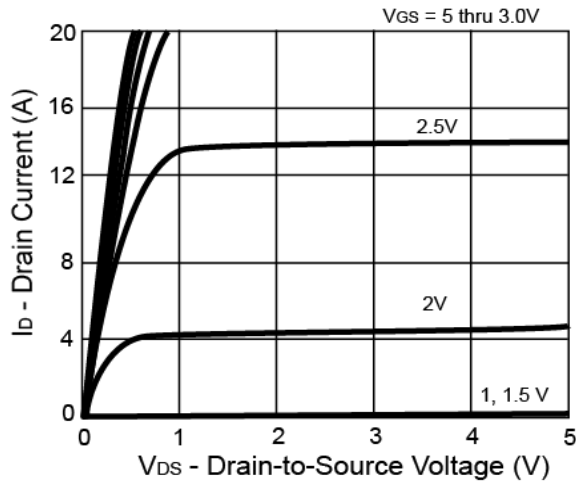
ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM3446CX6 RFG	SOT-26	3,000pcs / 7" Reel

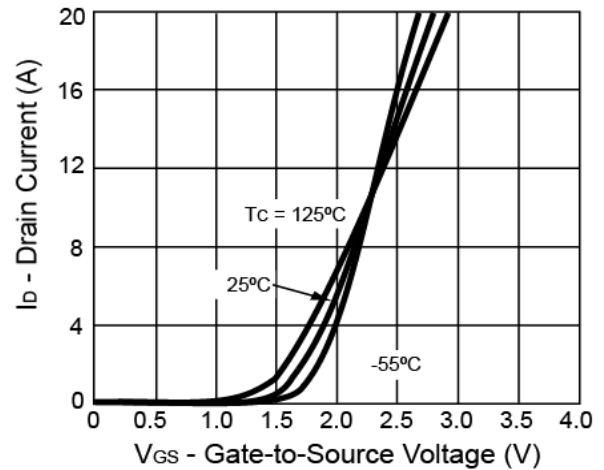
CHARACTERISTICS CURVES

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

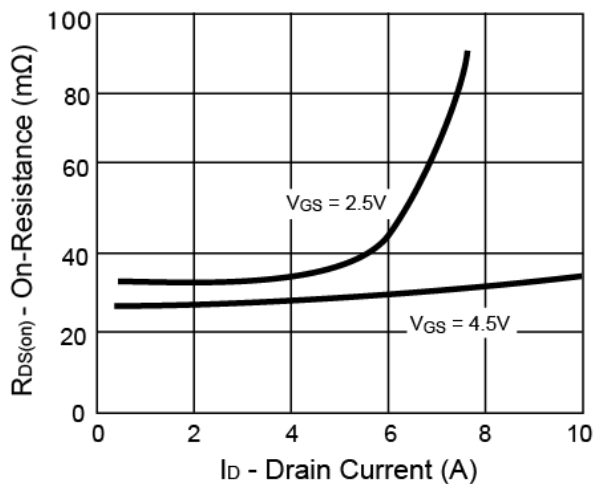
Output Characteristics



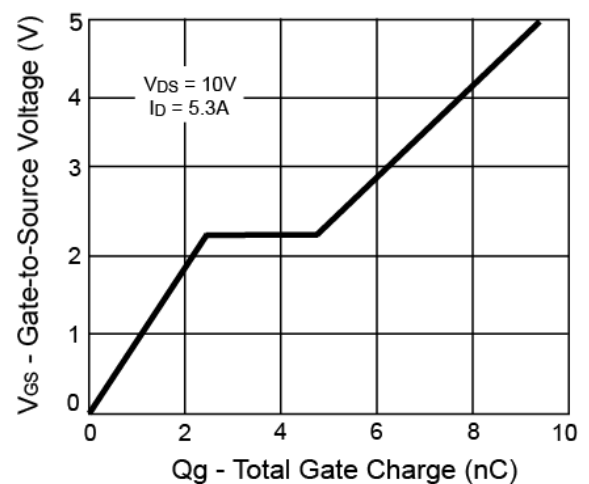
Transfer Characteristics



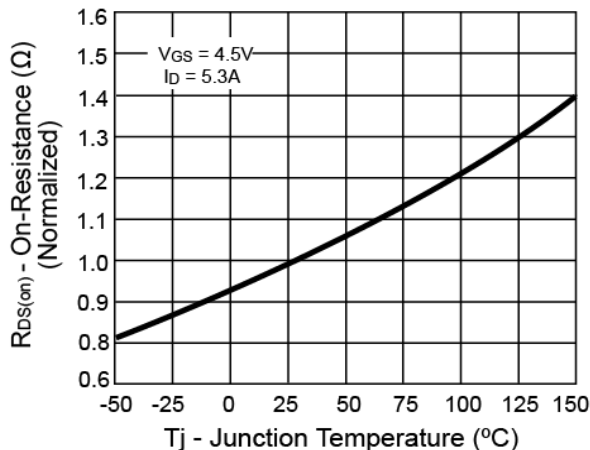
On-Resistance vs. Drain Current



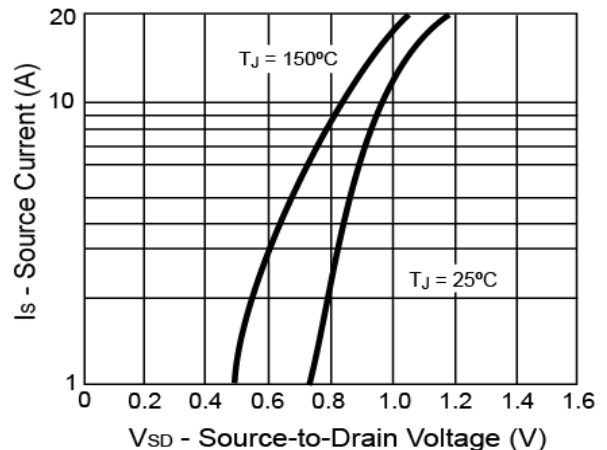
Gate Charge



On-Resistance vs. Junction Temperature



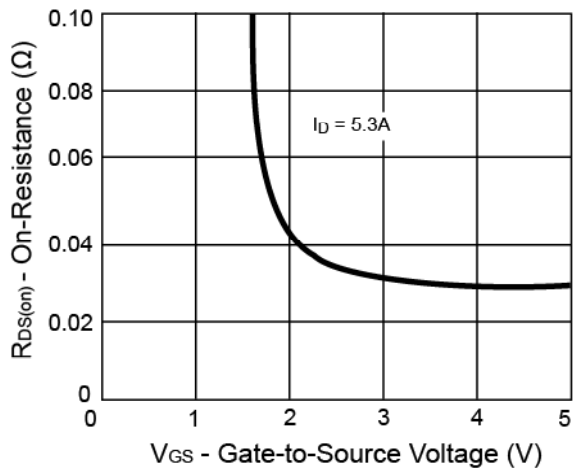
Source-Drain Diode Forward Voltage



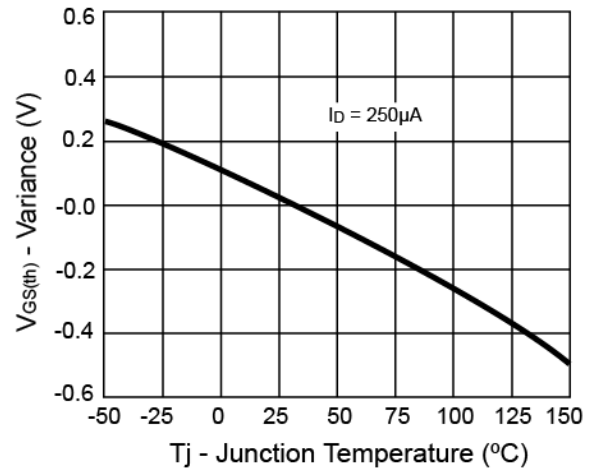
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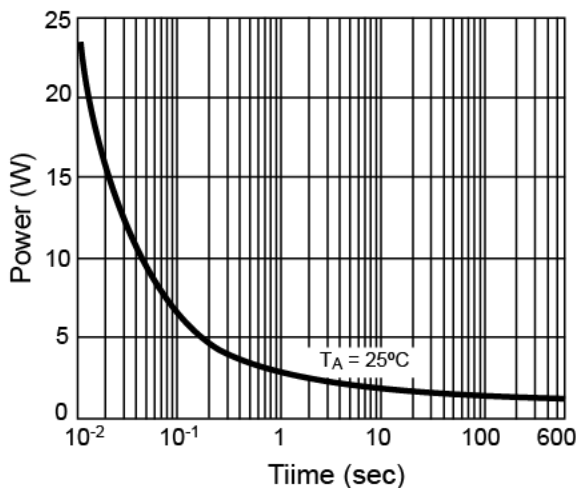
On-Resistance vs. Gate-Source Voltage



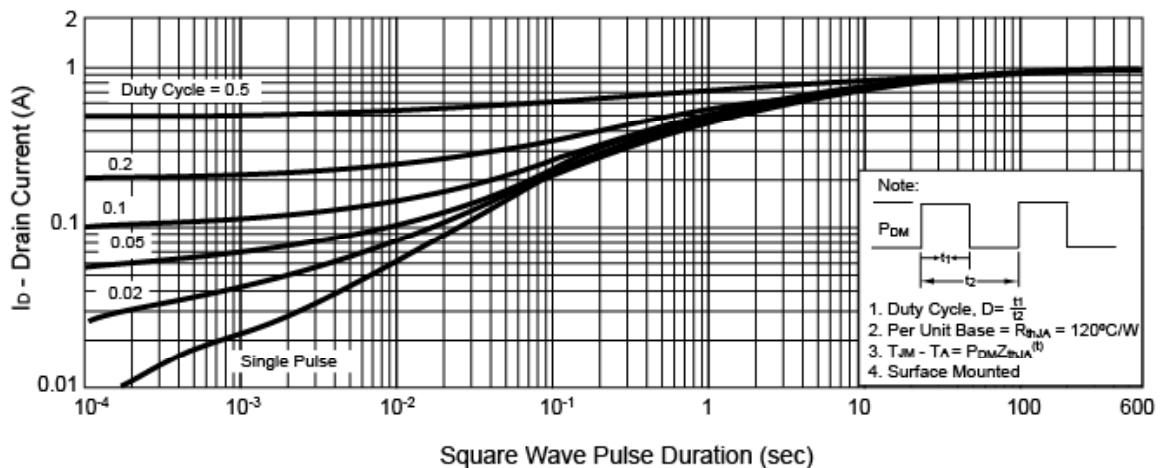
Threshold Voltage



Single Pulse Power

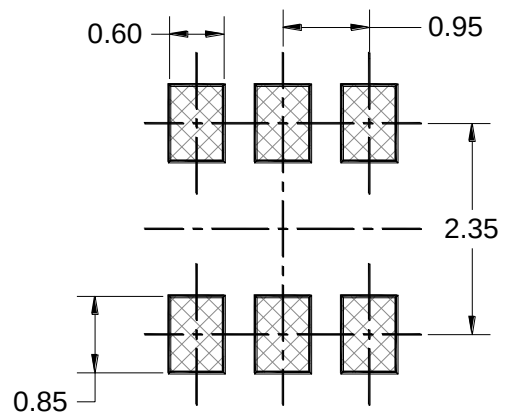
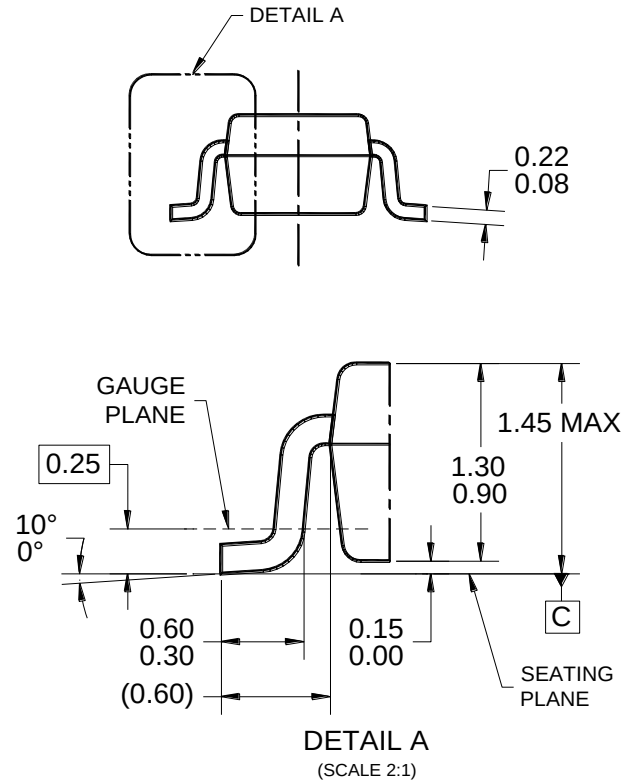
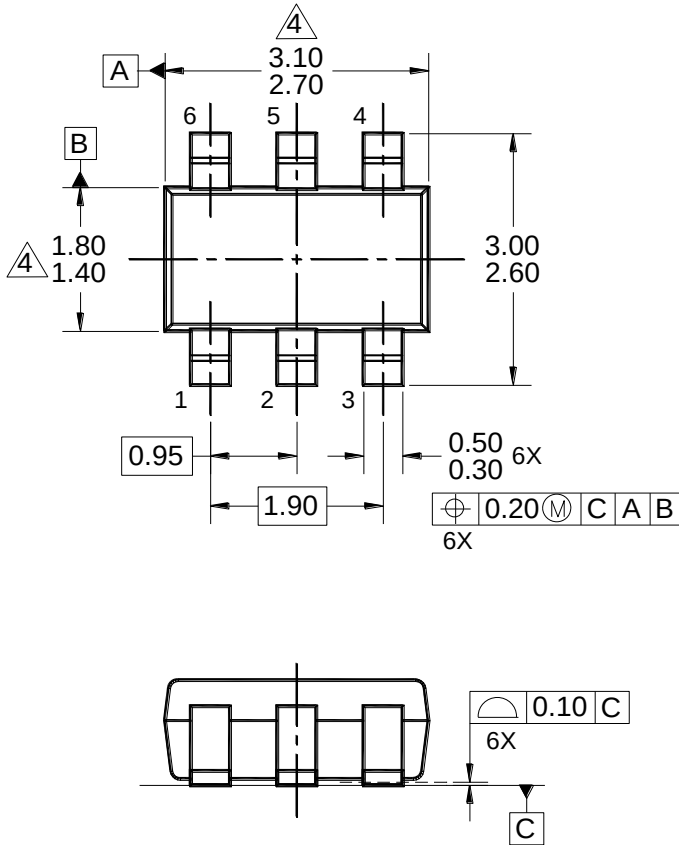


Normalized Thermal Transient Impedance, Junction-to-Ambient



PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

SOT-26



SUGGESTED PAD LAYOUT

MARKING DIAGRAM

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 MO-178, VARIATION AB.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SOT26-027 REV A.

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