

P-Channel Power MOSFET

-20V, -6.5A, 26mΩ

FEATURES

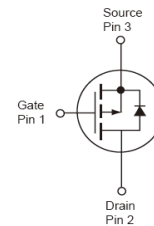
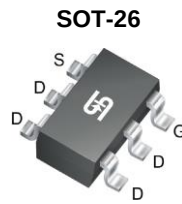
- Fast switching
- Suitable for -1.8V Gate Drive Applications
- Pb-free plating
- RoHS compliant
- Halogen-free mold compound

KEY PERFORMANCE PARAMETERS

PARAMETER	VALUE	UNIT
V_{DS}	-20	V
I_D	-6.5	A
$R_{DS(on)}$ (max)	$V_{GS} = -4.5V$	26
	$V_{GS} = -2.5V$	32
	$V_{GS} = -1.8V$	40
Q_g	19.5	nC

APPLICATION

- Battery Pack
- Portable Devices


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}	± 10	V
Continuous Drain Current	I_D	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
Pulsed Drain Current (Note 1)	I_{DM}	-26	A
Total Power Dissipation	P_{DTOT}	1.56	W
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
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	$R_{\theta JA}$	80	$^\circ\text{C/W}$

Notes: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. $R_{\theta JA}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ is shown for single device operation on FR-4 PCB in still air.

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

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static ^(Note 2)						
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 Body Leakage	V _{GS} = ±10V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V	I _{DSS}	--	--	-1	μA
	V _{DS} = -16V, T _J = 125°C		--	--	-10	
Drain-Source On-State Resistance	V _{GS} = -4.5V, I _D = -5A	R _{DS(on)}	--	21	26	mΩ
	V _{GS} = -2.5V, I _D = -4A		--	26	32	
	V _{GS} = -1.8V, I _D = -3A		--	32	40	
Forward Transconductance	V _{DS} = -10V, I _S = -5A	g _{fs}	--	15	--	S
Dynamic ^(Note 3)						
Total Gate Charge	V _{DS} = -10V, I _D = -5A, V _{GS} =- 4.5V	Q _g	--	19.5	--	nC
Gate-Source Charge		Q _{gs}	--	2	--	
Gate-Drain Charge		Q _{gd}	--	3.6	--	
Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, F = 1.0MHz	C _{iss}	--	1670	--	pF
Output Capacitance		C _{oss}	--	220	--	
Reverse Transfer Capacitance		C _{rss}	--	120	--	
Switching						
Turn-On Delay Time	V _{DD} = -10V, I _D = -1A, V _{GS} = -4.5V, R _{GEN} =25Ω	t _{d(on)}	--	10.4	--	ns
Turn-On Rise Time		t _r	--	37.5	--	
Turn-Off Delay Time		t _{d(off)}	--	89.1	--	
Turn-Off Fall Time		t _f	--	24.6	--	
Source-Drain Diode						
Forward Voltage	V _{GS} = 0V, I _S = -1A	V _{SD}	--	--	-1	V
Continuous Forward Current	Integral reverse diode in the MOSFET	I _S	--	--	-6.5	A
Pulse Forward Current		I _{SM}	--	--	-26	A

Notes:

- Pulse width limited by safe operating area
- Pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$
- Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM260P02CX RFG	SOT-23	3,000pcs / 7" Reel
TSM260P02CX6 RFG	SOT-26	3,000pcs / 7" Reel

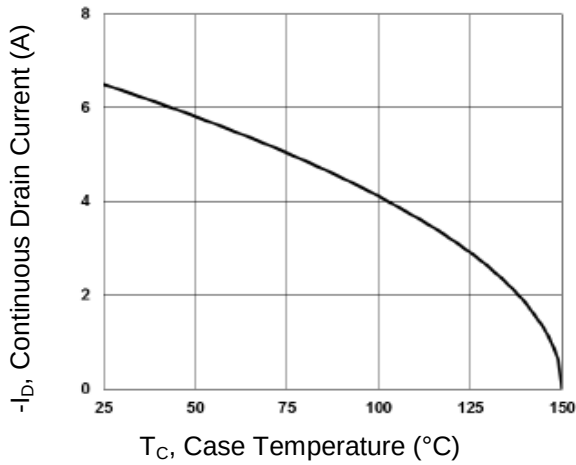
Note:

1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

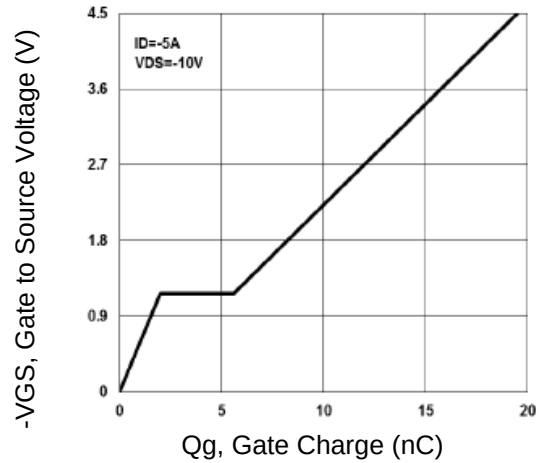
CHARACTERISTICS CURVES

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

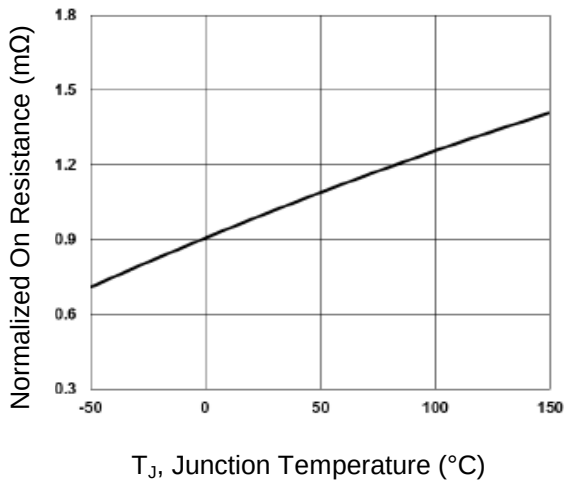
Continuous Drain Current vs. T_C



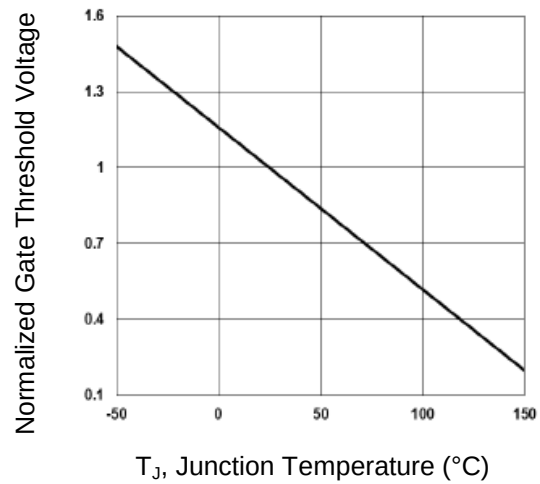
Gate Charge



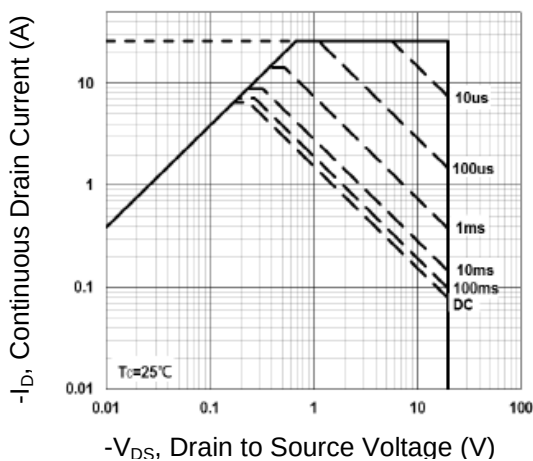
On-Resistance vs. Junction Temperature



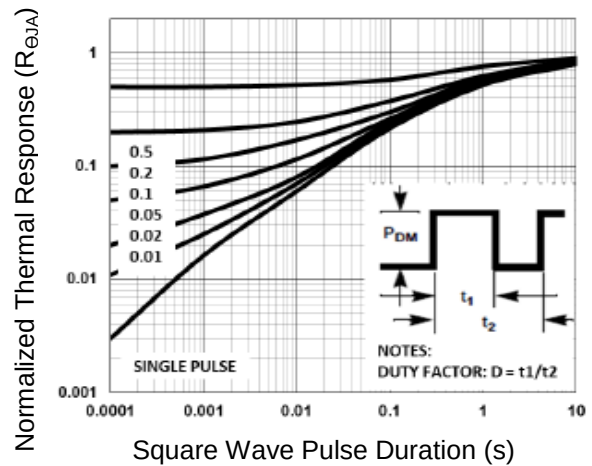
Threshold Voltage vs. Junction Temperature



Maximum Safe Operating Area

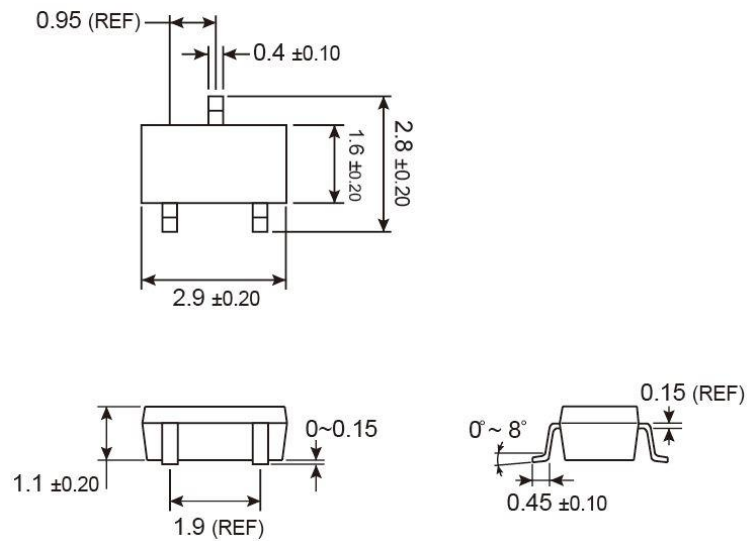


Normalized Thermal Transient Impedance Curve

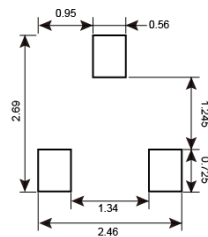


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

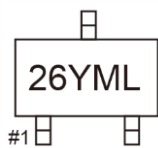
SOT-23



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



26 = Device Code

Y = Year Code

M = Month Code for Halogen Free Product

O =Jan **P** =Feb **Q** =Mar **R** =Apr

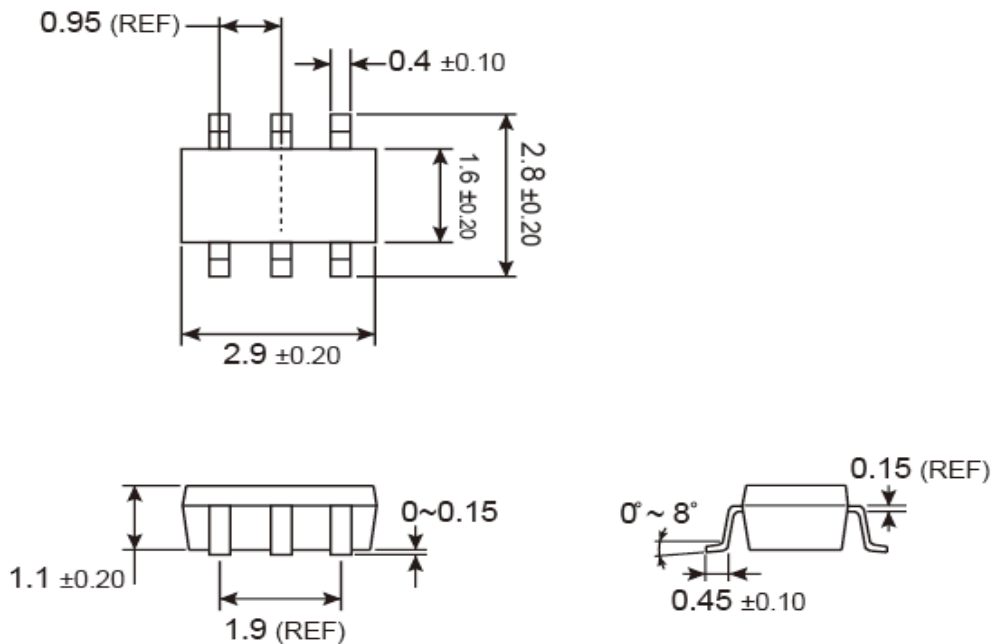
S =May **T** =Jun **U** =Jul **V** =Aug

W =Sep **X** =Oct **Y** =Nov **Z** =Dec

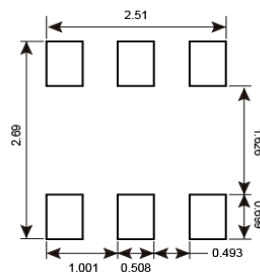
L = Lot Code

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

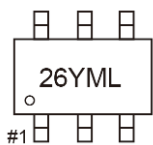
SOT-26



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



26 = Device Code

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 (1~9, A~Z)

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