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With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## N-Channel Power MOSFET

800V, 6A, 0.95Ω

### FEATURES

- Super-Junction technology
- High performance due to small figure-of-merit
- High ruggedness performance
- High commutation performance
- Pb-free plating
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

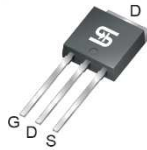
KEY PERFORMANCE PARAMETERS		
PARAMETER	VALUE	UNIT
$V_{DS}$	800	V
$R_{DS(on)}$ (max)	0.95	Ω
$Q_g$	19.6	nC

### APPLICATION

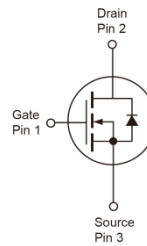
- Power Supply
- Lighting



TO-251 (IPAK)



TO-252 (DPAK)



**Notes:** MSL 3 (Moisture Sensitivity Level) for TO-252 (D-PAK) per J-STD-020

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	800	V
Gate-Source Voltage	$V_{GS}$	±30	V
Continuous Drain Current <sup>(Note 1)</sup>	$I_D$	$T_C = 25^\circ\text{C}$	6
		$T_C = 100^\circ\text{C}$	3.8
Pulsed Drain Current <sup>(Note 2)</sup>	$I_{DM}$	18	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	$P_{DTOT}$	110	W
Single Pulsed Avalanche Energy <sup>(Note 3)</sup>	$E_{AS}$	121	mJ
Single Pulsed Avalanche Current <sup>(Note 3)</sup>	$I_{AS}$	2.2	A
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	- 55 to +150	°C

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>LIMIT</b>	<b>UNIT</b>
Junction to Case Thermal Resistance	$R_{\theta JC}$	1.14	$^{\circ}C/W$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	62	$^{\circ}C/W$

**Notes:**  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins.  $R_{\theta JA}$  is guaranteed by design while  $R_{\theta CA}$  is determined by the user's board design.  $R_{\theta JA}$  shown below for single device operation on FR-4 PCB with minimum recommended footprint in still air.

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}C$ unless otherwise noted)						
<b>PARAMETER</b>	<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>MIN</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
<b>Static</b> (Note 4)						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	$BV_{DSS}$	800	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	2	--	4	V
Gate Body Leakage	$V_{GS} = \pm 30V, V_{DS} = 0V$	$I_{GSS}$	--	--	$\pm 100$	nA
Zero Gate Voltage Drain Current	$V_{DS} = 800V, V_{GS} = 0V$	$I_{DSS}$	--	--	1	$\mu A$
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 3A$	$R_{DS(on)}$	--	0.8	0.95	$\Omega$
<b>Dynamic</b> (Note 5)						
Total Gate Charge	$V_{DS} = 380V, I_D = 6A,$ $V_{GS} = 10V$	$Q_g$	--	19.6	--	nC
Gate-Source Charge		$Q_{gs}$	--	3.5	--	
Gate-Drain Charge		$Q_{gd}$	--	9.7	--	
Input Capacitance	$V_{DS} = 100V, V_{GS} = 0V,$ $f = 1.0MHz$	$C_{iss}$	--	691	--	pF
Output Capacitance		$C_{oss}$	--	63	--	
Gate Resistance	$F = 1MHz, \text{open drain}$	$R_g$	--	3.4	--	$\Omega$
<b>Switching</b> (Note 6)						
Turn-On Delay Time	$V_{DD} = 380V,$ $R_{GEN} = 25\Omega,$ $I_D = 6A, V_{GS} = 10V,$	$t_{d(on)}$	--	23	--	ns
Turn-On Rise Time		$t_r$	--	12	--	
Turn-Off Delay Time		$t_{d(off)}$	--	57	--	
Turn-Off Fall Time		$t_f$	--	11	--	
<b>Source-Drain Diode</b> (Note 4)						
Forward On Voltage	$I_S = 6A, V_{GS} = 0V$	$V_{SD}$	--	--	1.4	V
Reverse Recovery Time	$V_R = 100V, I_S = 6A$ $di_F/dt = 100A/\mu s$	$t_{rr}$	--	249	--	ns
Reverse Recovery Charge		$Q_{rr}$	--	2.6	--	$\mu C$

**Notes:**

1. Current limited by package.
2. Pulse width limited by the maximum junction temperature.
3.  $L = 50mH, I_{AS} = 2.2A, V_{DD} = 50V, R_G = 25\Omega,$  Starting  $T_J = 25^{\circ}C$
4. Pulse test:  $PW \leq 300\mu s,$  duty cycle  $\leq 2\%$ .
5. For DESIGN AID ONLY, not subject to production testing.
6. Switching time is essentially independent of operating temperature.

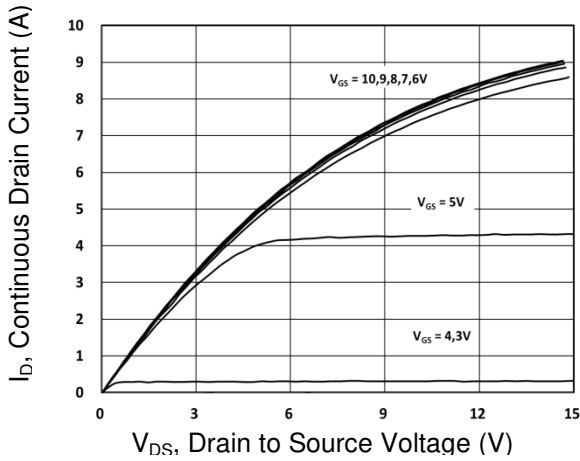
**ORDERING INFORMATION**

<b>PART NO.</b>	<b>PACKAGE</b>	<b>PACKING</b>
TSM80N950CH C5G	TO-251 (IPAK)	75pcs / Tube
TSM80N950CP ROG	TO-252 (DPAK)	2,500pcs / 13" Reel

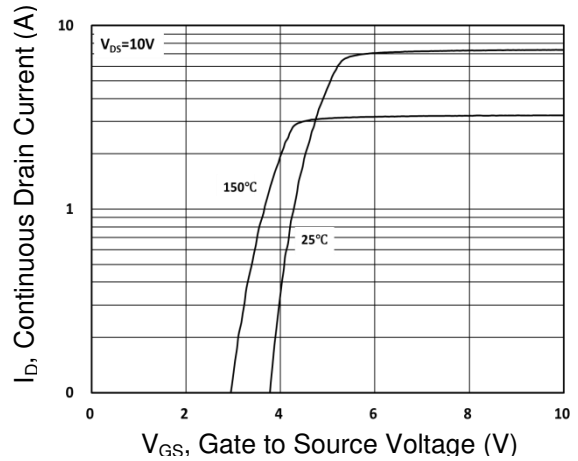
**CHARACTERISTICS CURVES**

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

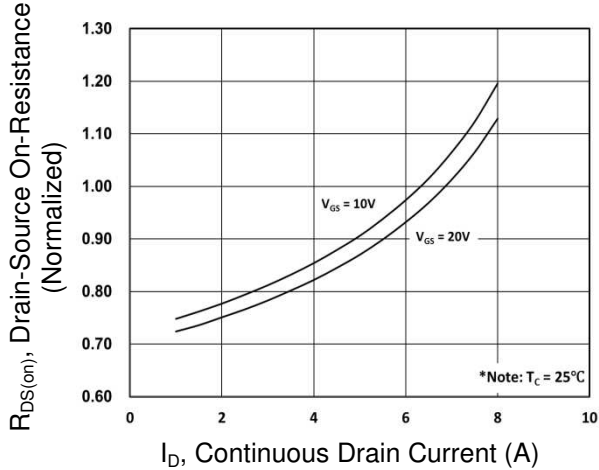
**Output Characteristics**



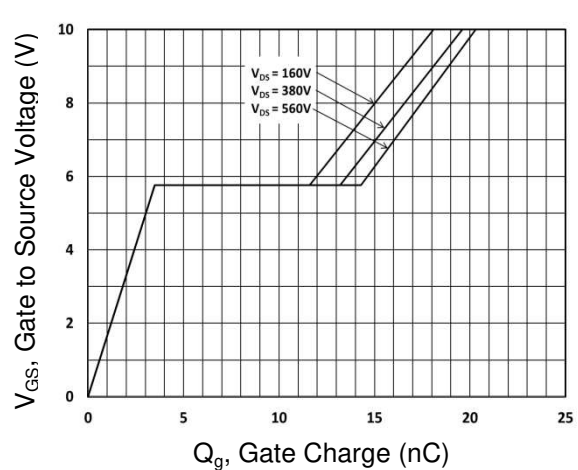
**Transfer Characteristics**



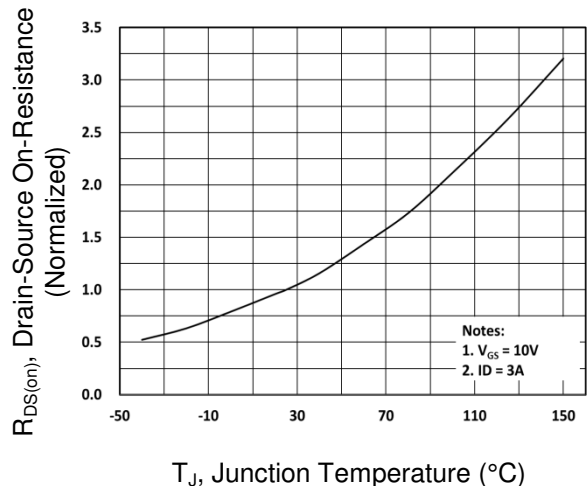
**On-Resistance vs. Drain Current**



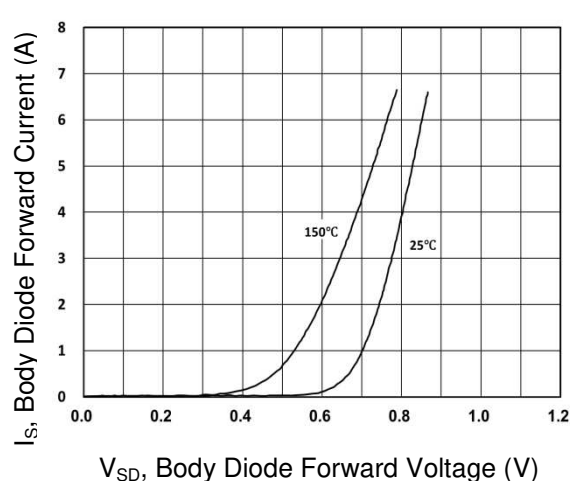
**Gate-Source Voltage vs. Gate Charge**



**On-Resistance vs. Junction Temperature**



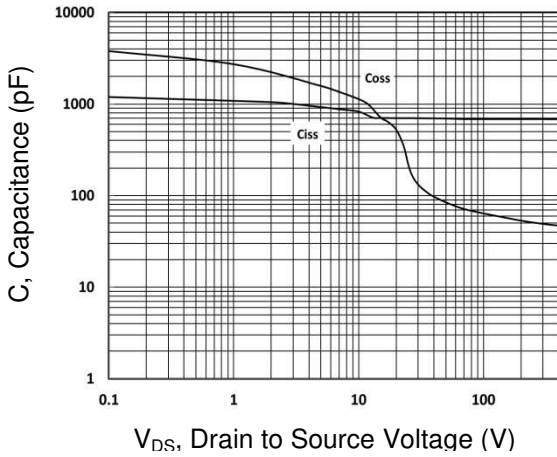
**Source-Drain Diode Forward Current vs. Voltage**



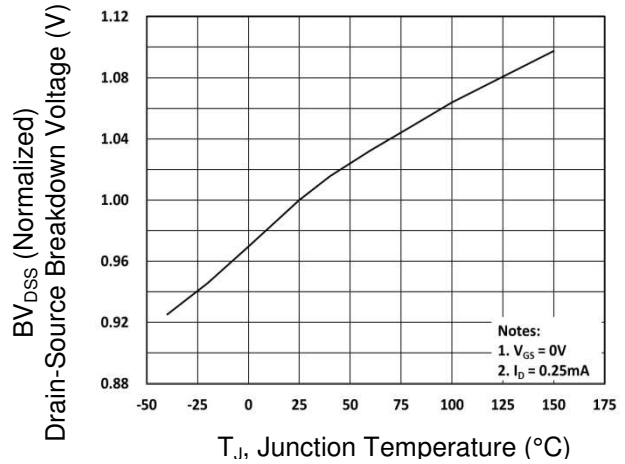
**CHARACTERISTICS CURVES**

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

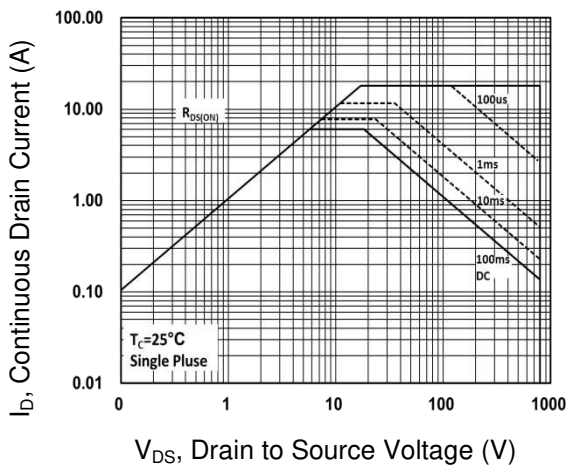
**Capacitance vs. Drain-Source Voltage**



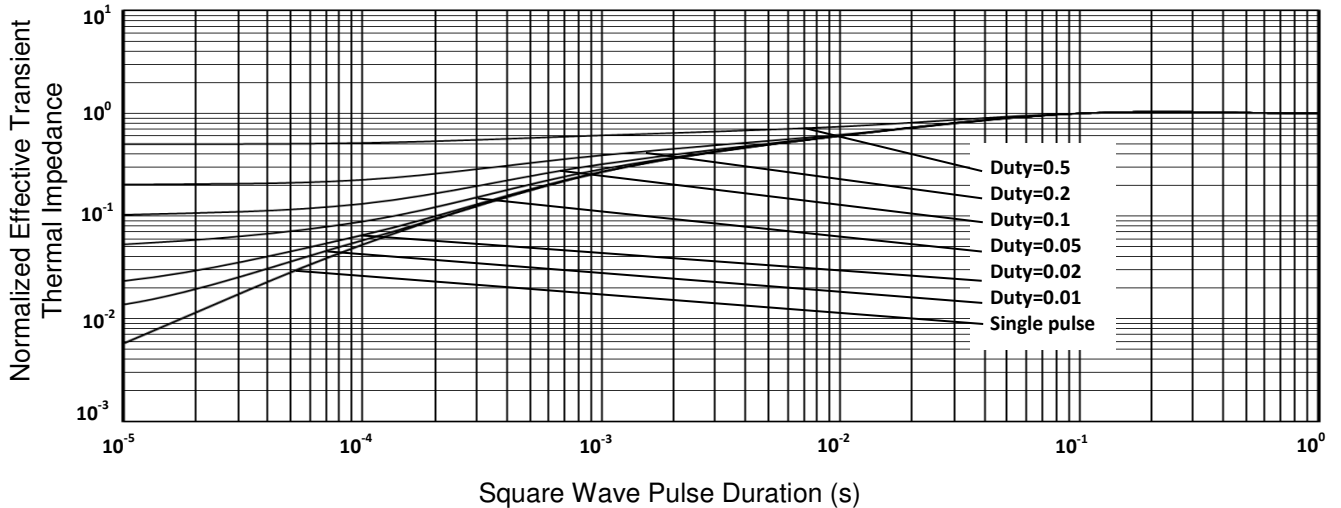
**$BV_{DSS}$  vs. Junction Temperature**



**Maximum Safe Operating Area**

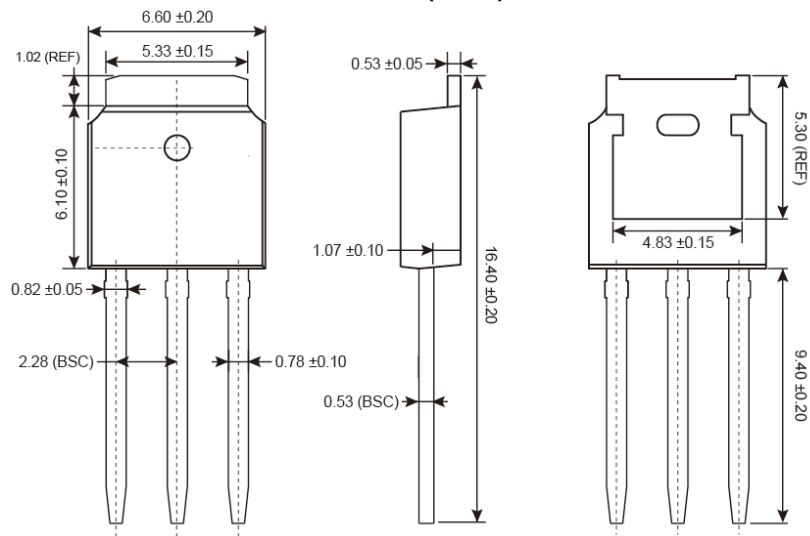


**Normalized Thermal Transient Impedance, Junction-to-Case**

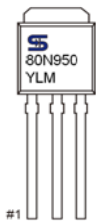


**PACKAGE OUTLINE DIMENSIONS** (Unit: Millimeters)

**TO-251 (IPAK)**



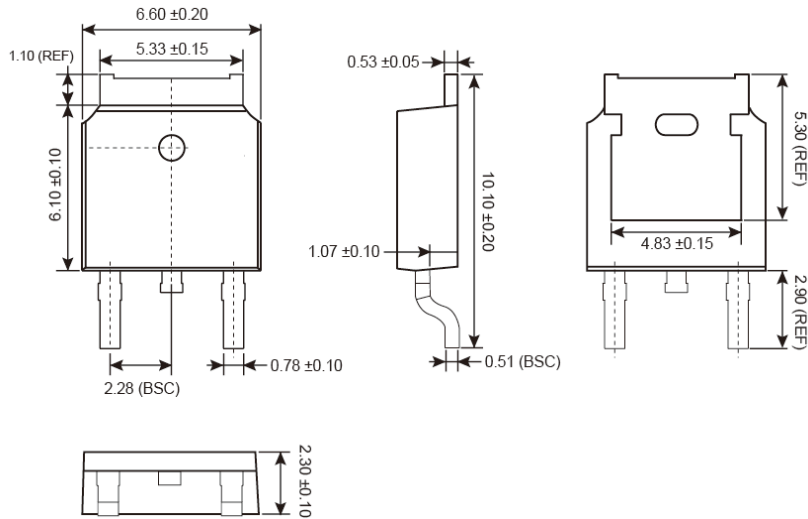
**MARKING DIAGRAM**



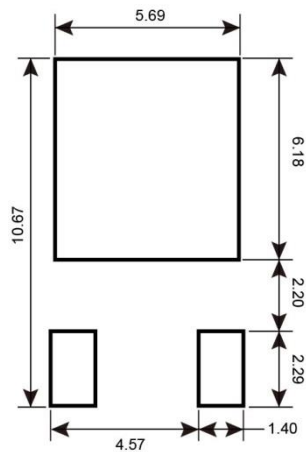
- Y** = Year Code
- M** = Month Code for Halogen Free Product
  - O** =Jan    **P** =Feb    **Q** =Mar    **R** =Apr
  - S** =May    **T** =Jun    **U** =Jul    **V** =Aug
  - W** =Sep    **X** =Oct    **Y** =Nov    **Z** =Dec
- L** = Lot Code (1~9, A~Z)

**PACKAGE OUTLINE DIMENSIONS** (Unit: Millimeters)

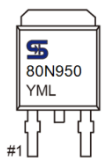
**TO-252 (DPAK)**



**SUGGESTED PAD LAYOUT** (Unit: Millimeters)



**MARKING DIAGRAM**



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