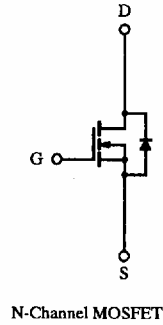
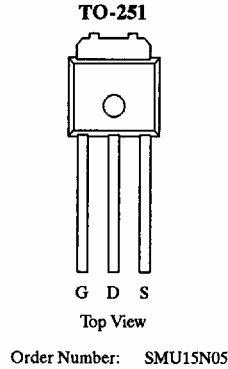
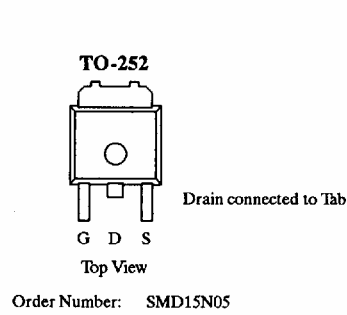


### N-Channel Enhancement-Mode Transistors

175°C Maximum Junction Temperature

#### Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D^a$ (A)
50	0.10	15



#### Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	SMD15N05	SMU15N05	Unit
Drain-Source Voltage	$V_{DS}$	50	50	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	
Continuous Drain Current <sup>b</sup>	$I_D$	$T_A = 25^\circ\text{C}$	3.3 <sup>b</sup>	A
		$T_A = 100^\circ\text{C}$	1.9 <sup>b</sup>	
Pulsed Drain Current (maximum current limited by package)	$I_{DM}$	24	24	
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	40	W
		$T_A = 25^\circ\text{C}$	2.0 <sup>b</sup>	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 175		$^\circ\text{C}$
Lead Temperature ( $1/16''$ from case for 10 sec.)	$T_L$	300		

#### Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Free Air, PC Board Mount	$R_{thJA}$	50	60	$^\circ\text{C/W}$
Junction-to-Ambient Free Air, Vertical Mount			125	
Junction-to-Case	$R_{thJC}$		3.0	

Notes:

- Calculated Rating for  $T_C = 25^\circ\text{C}$ , for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).
- Surface mounted on PC board.
- Free air, vertical mount.

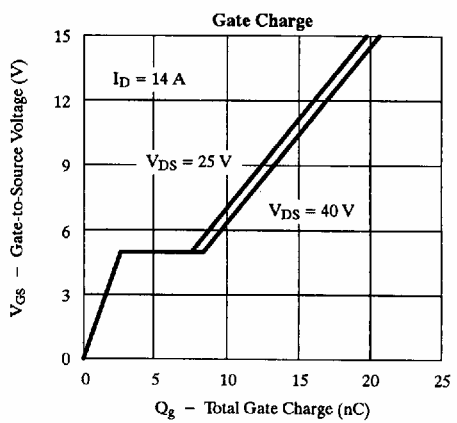
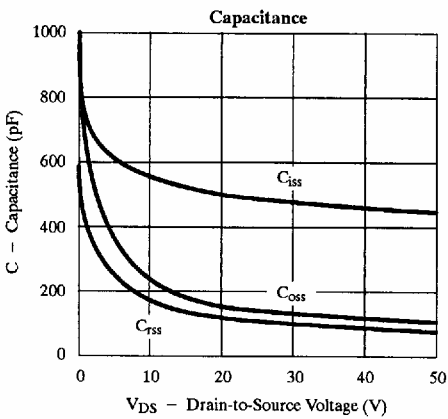
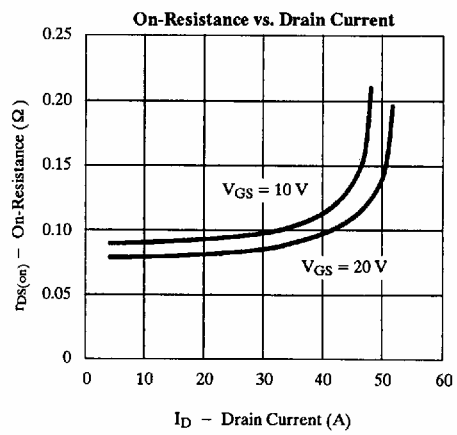
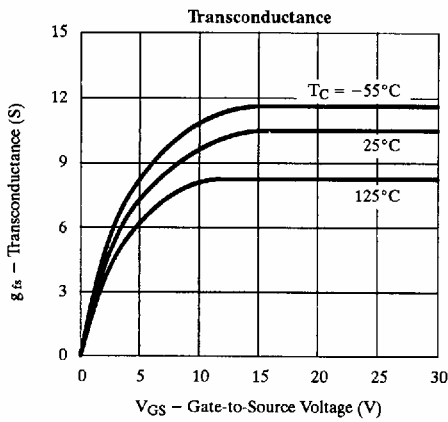
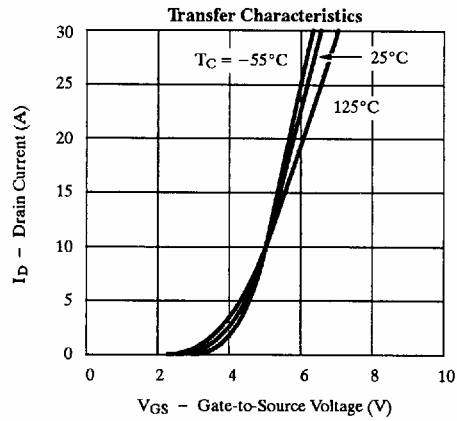
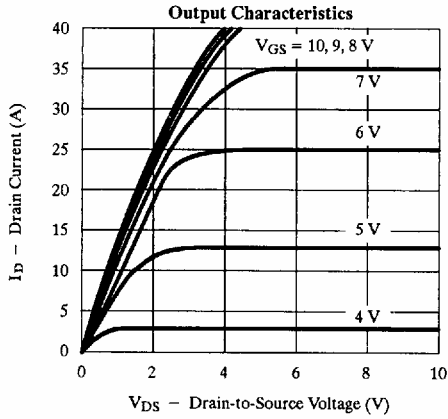
### Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	50			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0		4.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}$			25	$\mu\text{A}$
		$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			250	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	15			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 7.5\text{ A}$		0.07	0.10	$\Omega$
		$V_{GS} = 10\text{ V}, I_D = 7.5\text{ A}, T_J = 125^\circ\text{C}$		0.13	0.18	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 7.5\text{ A}$	3.0	4.8		S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		550		$\text{pF}$
Output Capacitance	$C_{oss}$			320		
Reverse Transfer Capacitance	$C_{rss}$			100		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 25\text{ V}, V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		15	30	$\text{nC}$
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			3.5		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			5		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 25\text{ V}, R_L = 1.67\ \Omega$ $I_D = 15\text{ A}, V_{GEN} = 10\text{ V}, R_G = 25\ \Omega$		15	30	$\text{ns}$
Rise Time <sup>c</sup>	$t_r$			50	85	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			80	90	
Fall Time <sup>c</sup>	$t_f$			80	110	
<b>Source-Drain Diode Ratings and Characteristics</b>						
Continuous Current	$I_S$		SMD15N05		3.3	A
			SMU15N05		1.0	
Pulsed Current	$I_{SM}$				24	
Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = 3.3\text{ A}, V_{GS} = 0\text{ V}$		1.8	2.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = 3.3\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		65		ns
Reverse Recovery Charge	$Q_{rr}$			0.16		$\mu\text{C}$

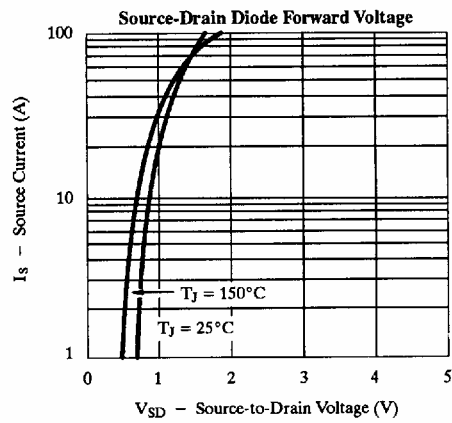
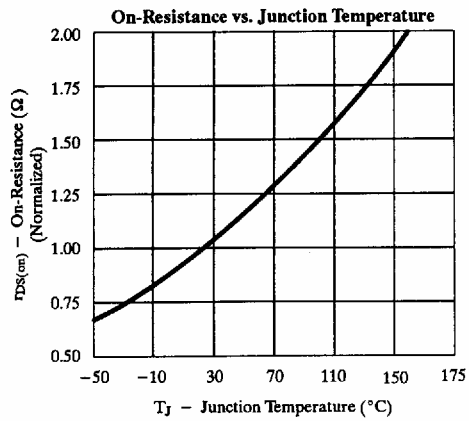
Notes:

- For design aid only; not subject to production testing.
- Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Independent of operating temperature.

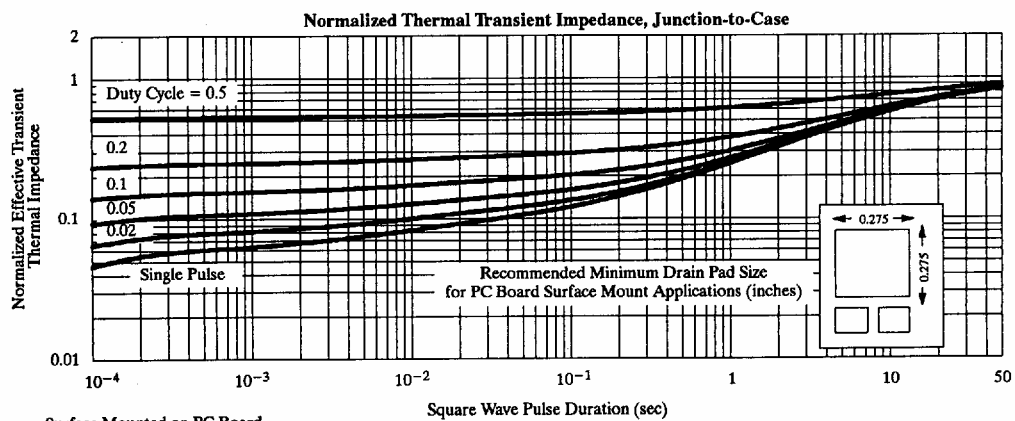
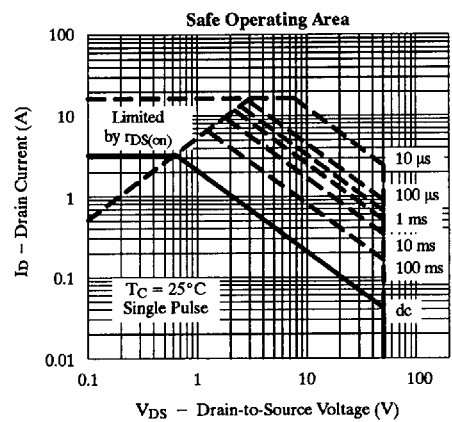
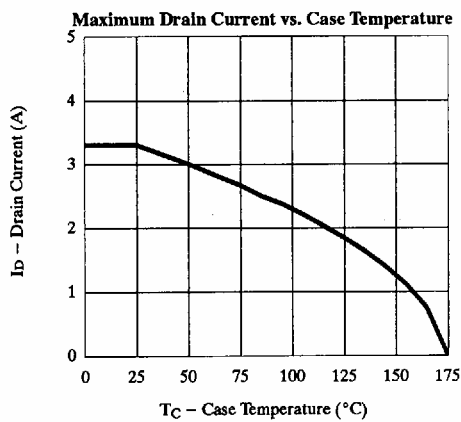
### Typical Characteristics (25°C Unless Otherwise Noted)



### Typical Characteristics (25°C Unless Otherwise Noted)



### Thermal Ratings<sup>a</sup>



a. Surface Mounted on PC Board.