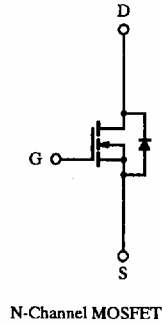
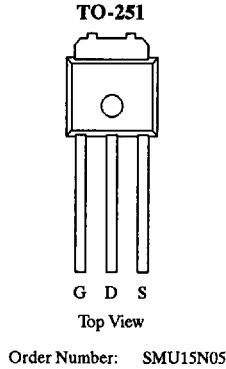
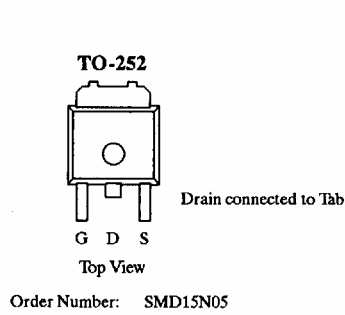


N-Channel Enhancement-Mode Transistors

175°C Maximum Junction Temperature

Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	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}	± 20	± 20	V
Continuous Drain Current ^b	I_D	$T_A = 25^\circ\text{C}$	3.3 ^b	2.3 ^c
		$T_A = 100^\circ\text{C}$	1.9 ^b	1.3 ^c
Pulsed Drain Current (maximum current limited by package)	I_{DM}	24	24	A
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	40	40
		$T_A = 25^\circ\text{C}$	2.0 ^b	1.0 ^c
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		$^\circ\text{C}$

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.

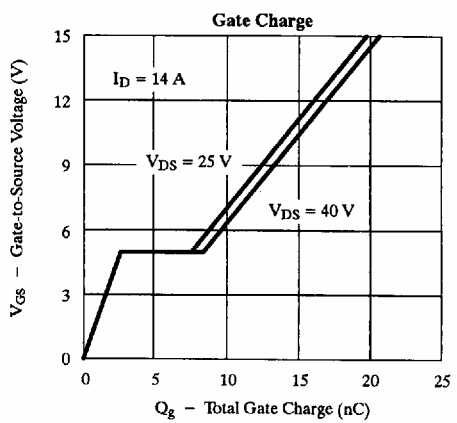
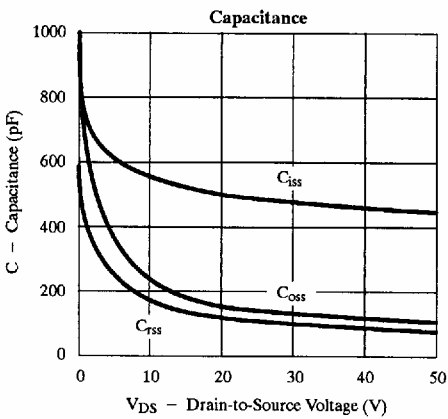
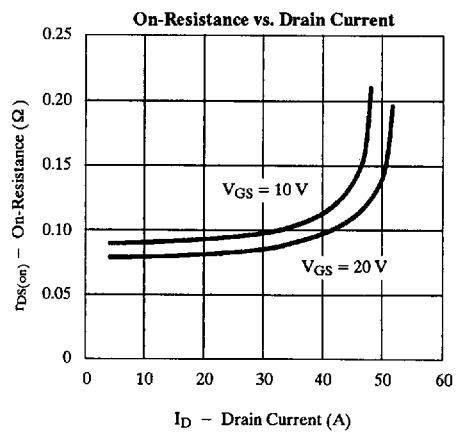
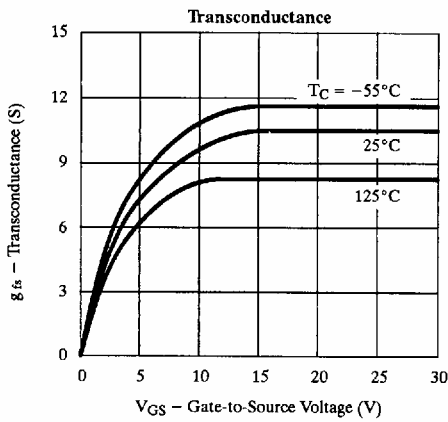
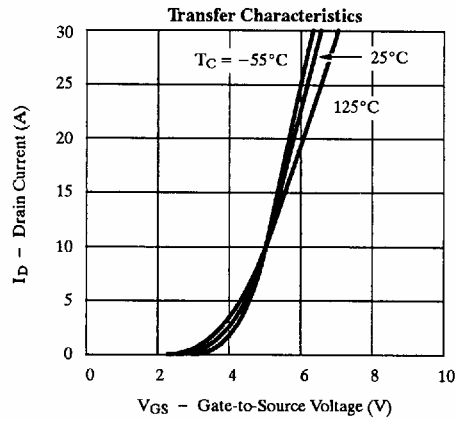
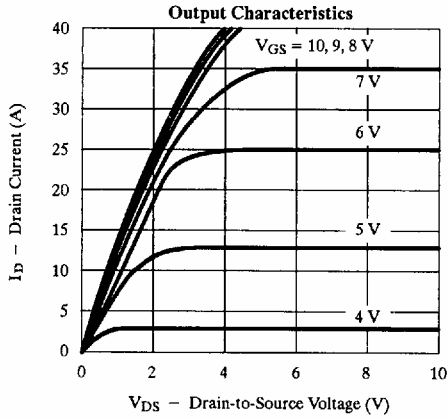
Specifications ($T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

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

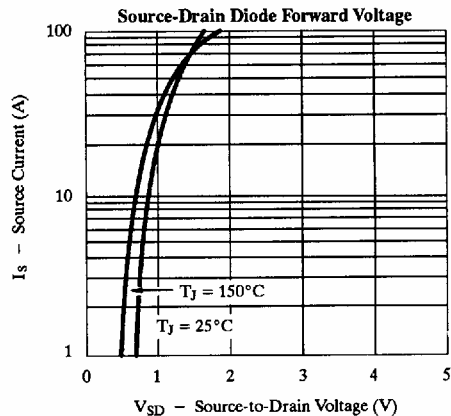
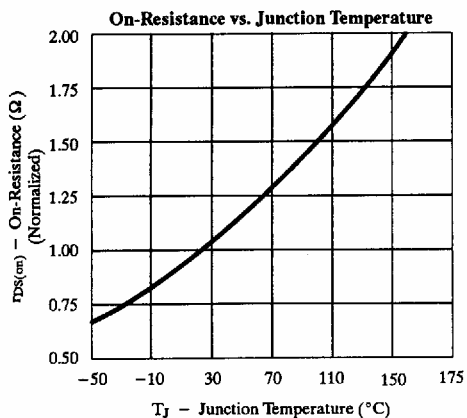
Notes:

- 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.

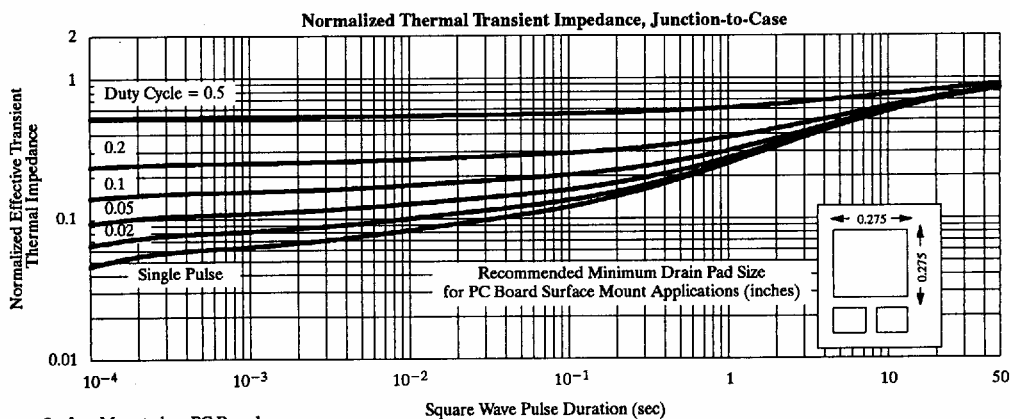
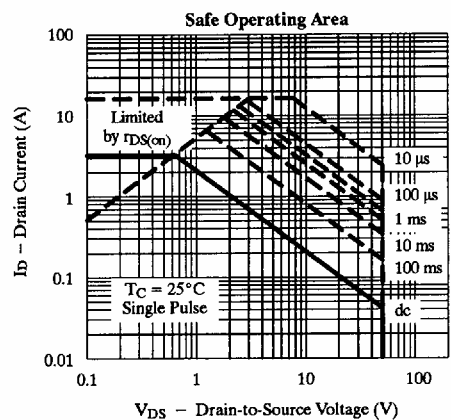
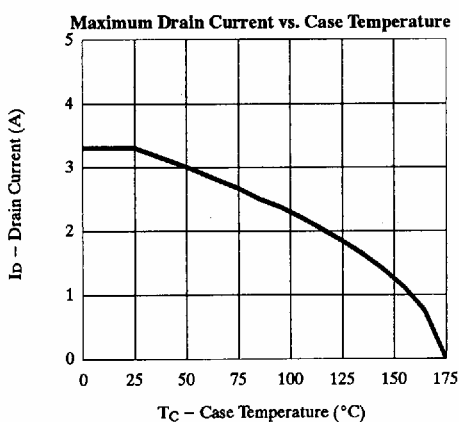
Typical Characteristics (25°C Unless Otherwise Noted)



Typical Characteristics (25°C Unless Otherwise Noted)



Thermal Ratings^a



a. Surface Mounted on PC Board.