

## Product Summary

BV <sub>DSS</sub>	R <sub>D(S(ON))</sub> Max	I <sub>D</sub> T <sub>C</sub> = +25°C
60V	6mΩ @ V <sub>GS</sub> = 10V	100A
	10mΩ @ V <sub>GS</sub> = 4.5V	85A

## Description and Applications

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

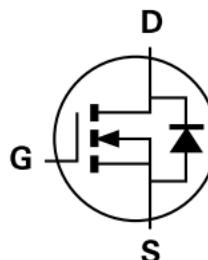
TO220-3



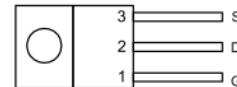
Top View



Bottom View



Equivalent Circuit

Top View  
Pin Out Configuration

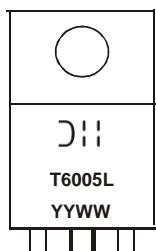
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6005LCT	TO220-3	50 Pieces/Tube

Notes:

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DII = Manufacturer's Marking  
T6005L = Product Type Marking Code  
YYWW = Date Code Marking  
YY or YY = Last Digit of Year (ex: 16 = 2016)  
WW or WW = Week Code (01 to 53)

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	$V_{DSS}$	60	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current (Note 6)	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	$I_D$	100 80	A
Maximum Continuous Body Diode Forward Current (Note 6)	$T_C = +25^\circ\text{C}$	$I_S$	83	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	130	A	
Avalanche Current, $L=0.1\text{mH}$	$I_{AS}$	29.5	A	
Avalanche Energy, $L=0.1\text{mH}$	$E_{AS}$	43.5	mJ	

**Thermal Characteristics**

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_D$	2.3	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	52.8	°C/W
Total Power Dissipation (Note 6)	$P_D$	104	W
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	1.2	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 7)						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero-Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS</b> (Note 7)						
Gate Threshold Voltage	$V_{GS(\text{TH})}$	1	—	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	4.5	6	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
—	—	8.8	10	—	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 12.5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	—	1.2	V	$V_{GS} = 0\text{V}, I_S = 20\text{A}$
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	$C_{ISS}$	—	2,962	—	pF	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{OSS}$	—	965	—		
Reverse Transfer Capacitance	$C_{RSS}$	—	60	—		
Gate Resistance	$R_G$	—	0.66	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_G$	—	47.1	—	nC	$V_{DD} = 30\text{V}, I_D = 50\text{A}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_G$	—	23.1	—		
Gate-Source Charge	$Q_{GS}$	—	10.2	—		
Gate-Drain Charge	$Q_{GD}$	—	12.5	—		
Turn-On Delay Time	$t_{D(\text{ON})}$	—	8.3	—		
Turn-On Rise Time	$t_R$	—	9.4	—	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, I_D = 30\text{A}, R_G = 3.3\Omega$
Turn-Off Delay Time	$t_{D(\text{OFF})}$	—	22	—		
Turn-Off Fall Time	$t_F$	—	8.9	—		
Reverse Recovery Time	$t_{RR}$	—	40.4	—	ns	$I_F = 30\text{A}, \text{di}/\text{dt} = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	49.7	—		

Notes:

5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on infinite heat sink.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

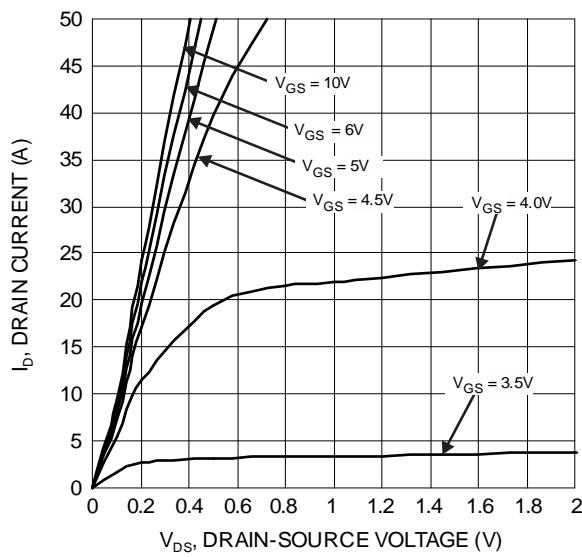


Figure 1 Typical Output Characteristics

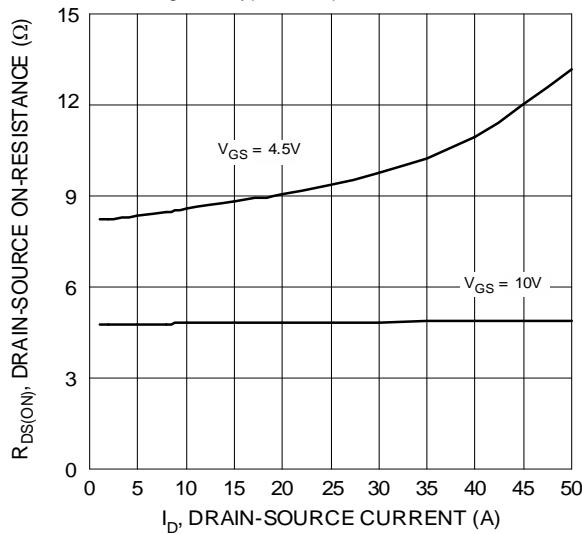


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

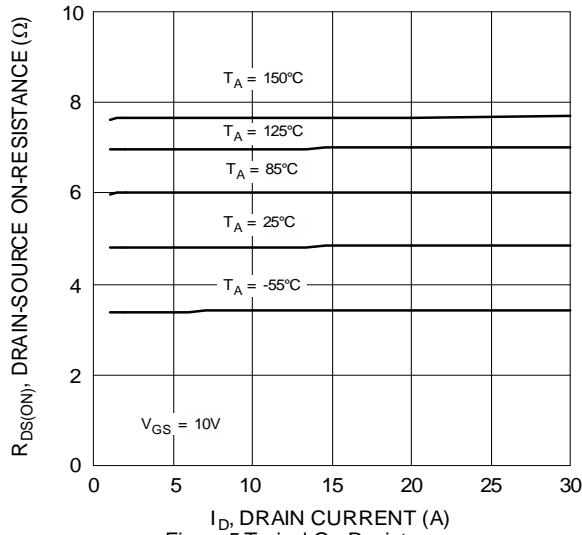


Figure 5 Typical On-Resistance vs.  
Drain Current and Temperature

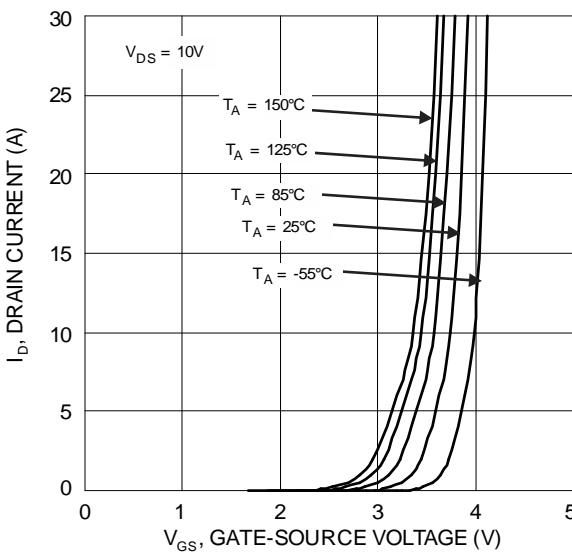


Figure 2 Typical Transfer Characteristics

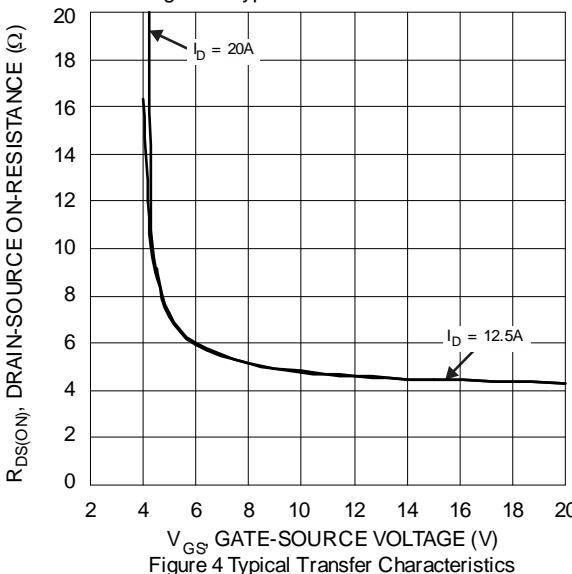


Figure 4 Typical Transfer Characteristics

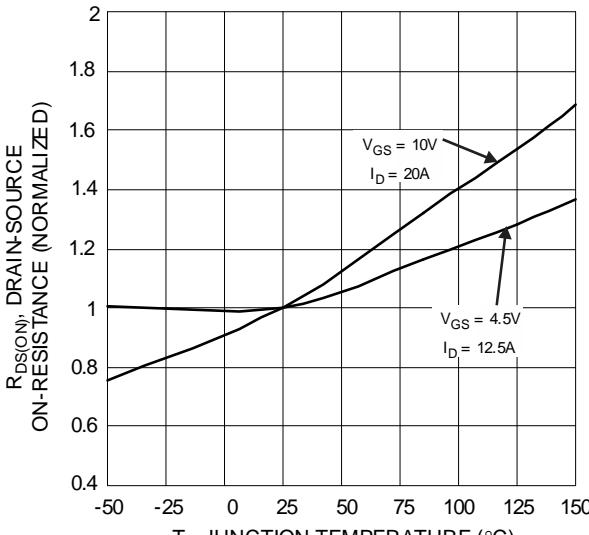


Figure 6 On-Resistance Variation with Temperature

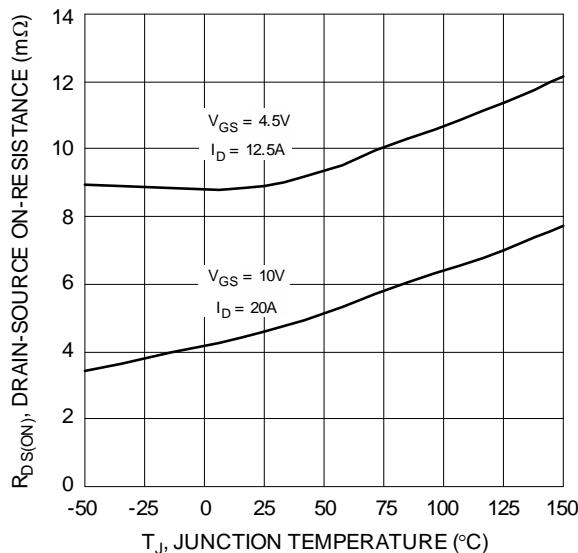


Figure 7 On-Resistance Variation with Temperature

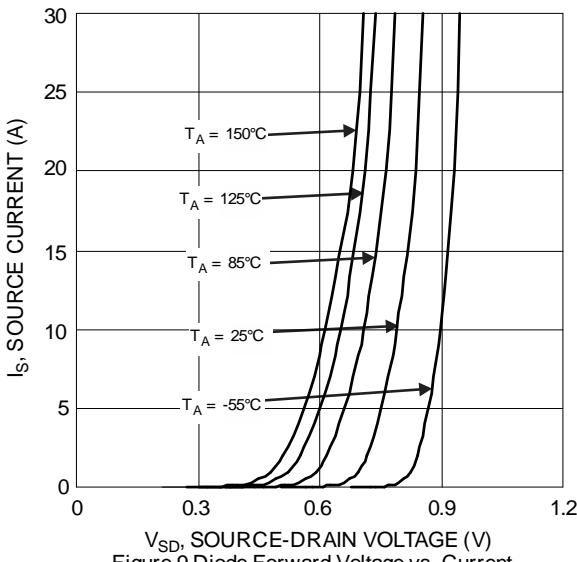


Figure 9 Diode Forward Voltage vs. Current

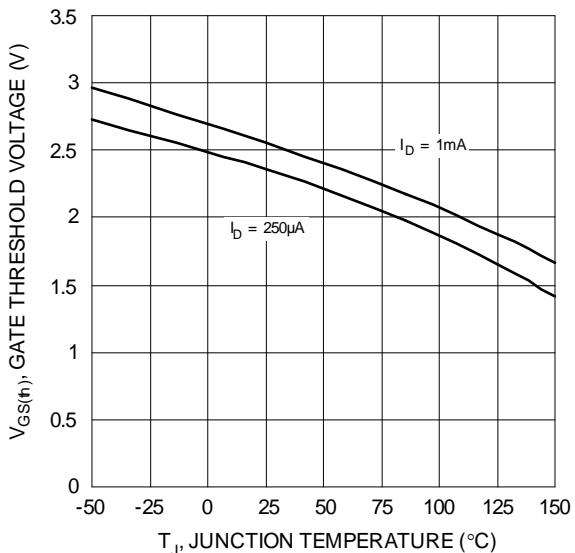


Figure 8 Gate Threshold Variation vs. Junction Temperature

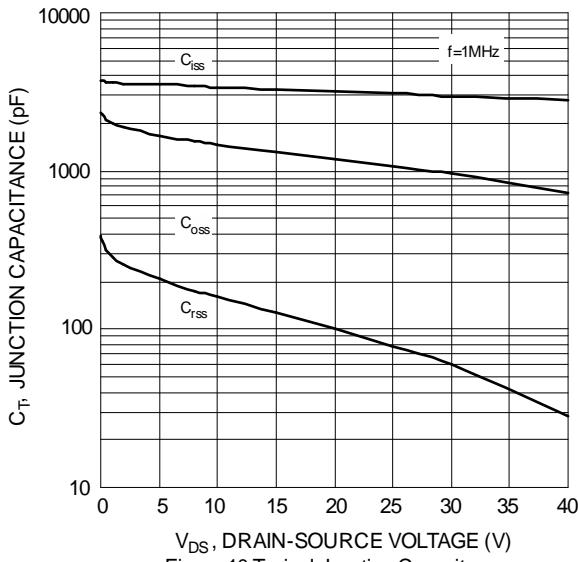


Figure 10 Typical Junction Capacitance

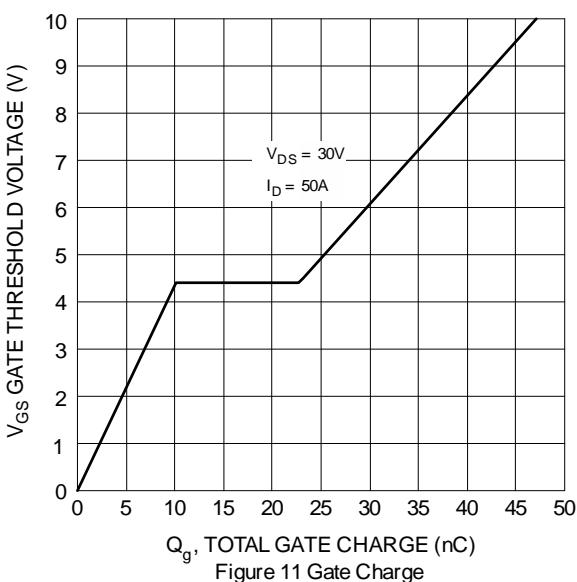


Figure 11 Gate Charge

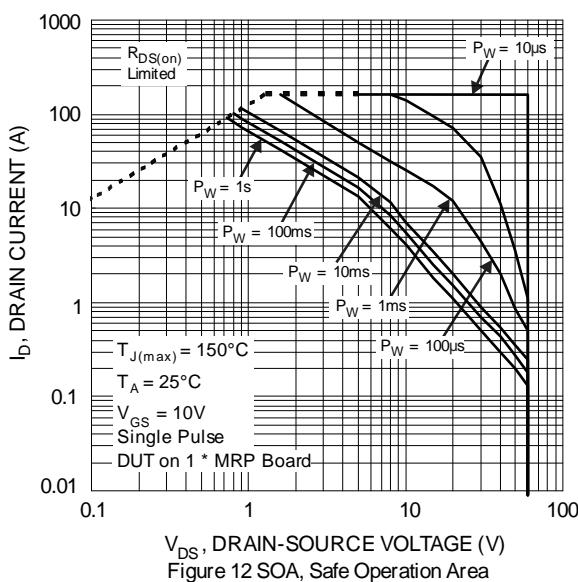


Figure 12 SOA, Safe Operation Area

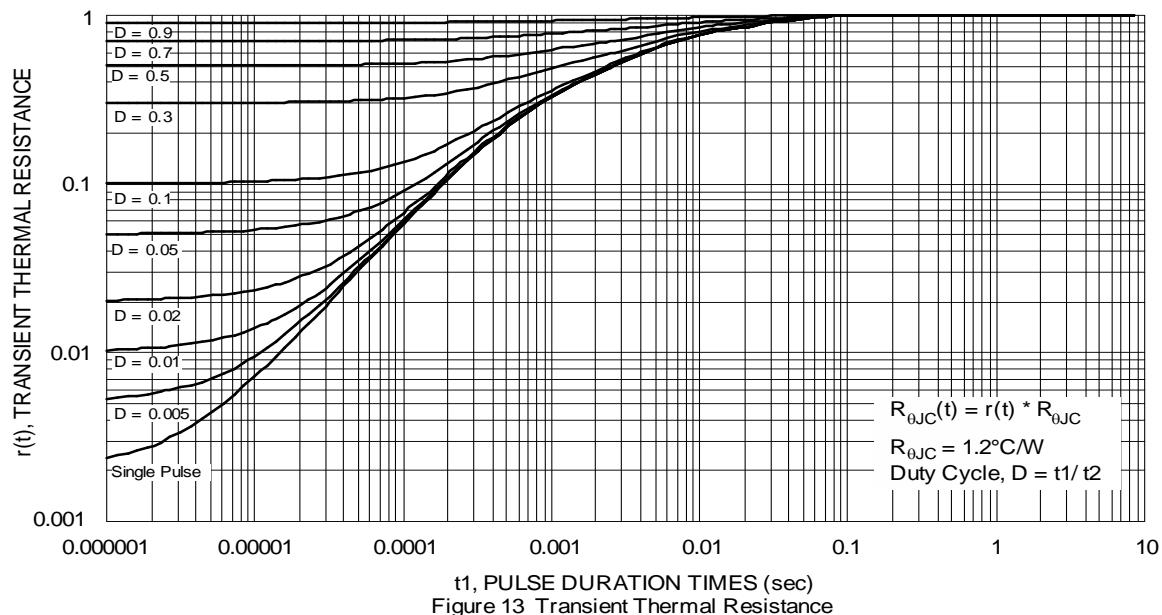
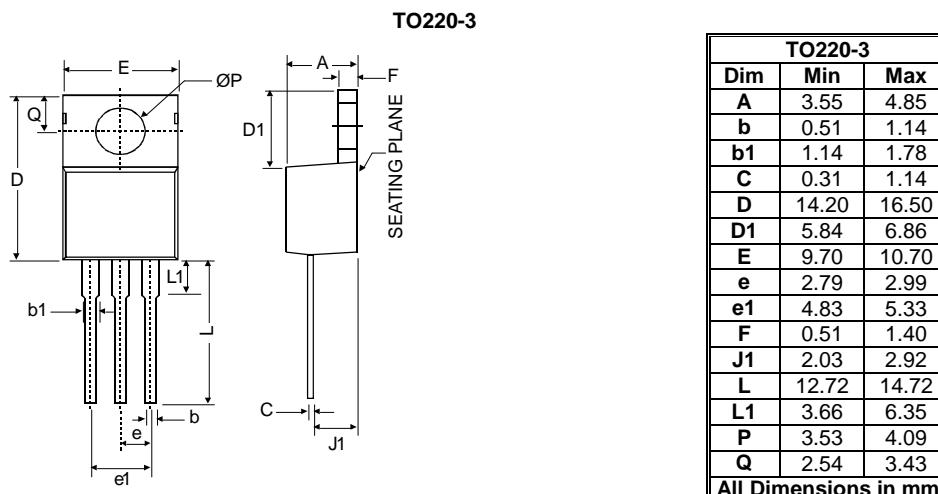


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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